Final

December 2000

HETCH HETCHY WATER TREATMENT PROJECT CHLORAMINE CONVERSION

Environmental Impact Report

San Francisco Planning Department File No. 1998.898E
State Clearinghouse No. 199912090

Draft EIR Publication Date: June 3, 2000
Draft EIR Public Hearing Date: July 11, 2000 in San Mateo
July 12, 2000 in Pleasanton
July 13, 2000 in San Francisco
Draft EIR Public Comment Period: June 3, 2000 through July 19, 2000
EIR Certification Date: October 19, 2000

City and County of San Francisco
San Francisco Planning Department

SAN FRANCISCO

CITY PLANNING COMMISSION

MOTION NO. 16010

ADOPTING FINDINGS RELATED TO THE CERTIFICATION OF A FINAL ENVIRONMENTAL IMPACT REPORT FOR THE PROPOSED CONVERSION OF THE DISINFECTANT FOR THE SAN FRANCISCO PUBLIC UTILITIES COMMISSION DRINKING WATER SUPPLY FROM CHLORINE TO CHLORAMINE.

MOVED, That the San Francisco Planning Commission (hereinafter "Commission") hereby CERTIFIES the Final Environmental Impact Report identified as case file No. 1998.898E, (hereinafter "Project") based upon the following findings:

1) The City and County of San Francisco, acting through the Planning Department (hereinafter "Department") fulfilled all procedural requirements of the California Environmental Quality Act (Cal. Pub. Res. Code Section 21000 et seq., hereinafter "CEQA"), the State CEQA Guidelines (Cal. Admin. Code Title 14, Section 15000 et. seq., (hereinafter "CEQA Guidelines") and Chapter 31 of the San Francisco Administrative Code (hereinafter "Chapter 31").

a. The Department determined that an Environmental Impact Report (hereinafter "EIR") was required and provided public notice of that determination by publication in a newspaper of general circulation on November 20, 1999.

b. On June 3, 2000, the Department published the Draft Environmental Impact Report (hereinafter "DEIR") and provided public notice in a newspaper of general circulation of the availability of the DEIR for public review and comment and of the date and time of the Planning Commission public hearing on the DEIR; this notice was mailed to the Department's list of persons requesting such notice.

c. Notices of availability of the DEIR and of the date and time of the public hearing were posted near the project sites the week of June 5, 2000.

d. On June 2, 2000 copies of the DEIR were mailed or otherwise delivered to a list of persons requesting it, to those noted on the distribution list in the DEIR, to adjacent property owners, and to government agencies, the latter both directly and through the State Clearinghouse.

e. Notice of Completion was filed with the State Secretary of Resources via the State Clearinghouse on June 2, 2000.

2) The Commission held a duly advertised public hearings on said Draft Environmental Impact Report on July 11, 2000 in San Mateo, on July 12 in Pleasanton, and on July 13 in San Francisco at which opportunity for public comment was given, and public comment was received on the DEIR. The period for acceptance of written comments ended on July 19, 2000.

3) The Department prepared responses to comments on environmental issues received at the public hearing and in writing during the 46-day public review period for the DEIR, prepared revisions to the text of the DEIR in response to comments received or based on additional information that became available during the public review period, and corrected errors in the DEIR. This material was presented in a "Draft Summary of Comments and Responses," published on September 29, 2000, was distributed to the Commission and to all parties who commented on the DEIR, and was available to others upon request at Department offices.

4) A Final Environmental Impact Report has been prepared by the Department, consisting of the Draft Environmental Impact Report, any consultations and comments received during the review process, any additional information that became available, and the Summary of Comments and Responses all as required by law.

5) Project Environmental Impact Report files have been made available for review by the Commission and the public. These files are available for public review at the Department offices at 1660 Mission Street, and are part of the record before the Commission.

6) On October 19, 2000 the Commission reviewed and considered the Final Environmental Impact Report and hereby does find that the contents of said report and the procedures through which the Final Environmental Impact Report was prepared, publicized and reviewed comply with the provisions of CEQA, the CEQA Guidelines and Chapter 31 of the San Francisco Administrative Code.

7) The Planning Commission hereby does find that the Final Environmental Impact Report concerning File No. 1998.898E: Hetch Hetchy Water Treatment Project - Chloramine Conversion reflects the independent judgment and analysis of the City and County of San Francisco, is adequate, accurate and objective, and that the Summary of Comments and Responses contains no significant revisions to the Draft Environmental Impact Report, and hereby does CERTIFY THE COMPLETION of said Final Environmental Impact Report in compliance with CEQA and the CEQA Guidelines.

8) The Commission, in certifying the completion of said Final Environmental Impact Report, hereby does find that the project described in the Environmental Impact Report would have no unavoidable significant adverse effects on the environment.

I hereby certify that the foregoing Motion was ADOPTED by the Planning Commission at its regular meeting of October 19, 2000.

Linda Avery
Commission Secretary

SPEAKER(S):	None
ACTION:	Final Environmental Impact Report Certified
AYES:	Commissioners Theoharis, Mills, Joe, Baltimore, Chinchilla, and Salinas
ABSENT:	Commissioner Fay
ADOPTED:	October 19, 2000

Final

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Changes from the text of the Draft EIR are indicated by a dot (•)

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CHAPTER I

SUMMARY

A. INTRODUCTION

The San Francisco Public Utilities Commission (SFPUC) is proposing that the residual disinfectant for the water supply be converted from chlorine to chloramine, a combination of chlorine and ammonia. This change is proposed in order to improve the reliability of the drinking water system to meet the requirements of the Safe Drinking Water Act and new federal water quality requirements that became effective in 1999. The project would require construction of new facilities, or modification of existing facilities or operations, at various points along the SFPUC water supply system, including locations in San Joaquin, Alameda, San Mateo, and San Francisco Counties. The project would affect water supply customers in San Francisco, as well as customers of other Bay Area water agencies that purchase drinking water from the SFPUC.

In accordance with the California Environmental Quality Act (CEQA), the San Francisco Planning Department prepared and circulated an Initial Study on the proposed project in November 1999. The Initial Study concluded that this project could have a significant effect on the environment and that an environmental impact report (EIR) was required. This EIR focuses on the impact areas that were identified in the Initial Study as potentially significant, including: land use and recreation, biological resources, hydrology and water quality, public health and water supply, aesthetics (or visual quality), cultural resources, geology and seismicity, hazardous materials, transportation, and noise.

The SFPUC provides drinking water to 2.4 million customers in San Francisco and portions of San Mateo, Santa Clara, and Alameda Counties. The SFPUC water supply system originates from three sources: the Tuolumne River in the Sierra Nevada mountains, local runoff from watersheds in Alameda and Santa Clara Counties, and local runoff from watersheds in San Mateo County. The water is conveyed to the Bay Area through about 150 miles of aqueducts, pipelines, tunnels, and reservoirs. The SFPUC conducts ongoing studies and monitoring of the water system to ensure reliability and the ability to meet drinking water regulations. A recent study concluded that the current water disinfection method cannot reliably meet new federal government requirements for disinfection by-products, but that these standards could reliably be met by using chloramine in the disinfection process.

● The purpose of this EIR is to assess potential environmental impacts associated with the Hetch Hetchy Water Treatment Project--Chloramine Conversion. The San Francisco Planning Department, Major Environmental Analysis (MEA) section, is the lead agency responsible for the environmental review process, and the San Francisco Planning Commission has certified that this EIR is accurate and complete; therefore, the SFPUC can take action on the proposed project. As

part of the environmental review process, the Planning Department has conducted a series of public hearings in San Francisco, on the Peninsula, and in the Pleasanton area that solicited comments from the public and agencies on the Draft EIR.

B. PROJECT DESCRIPTION

The overall purpose of the Hetch Hetchy Water Treatment Project--Chloramine Conversion is to improve the reliability of the SFPUC drinking water supply system to meet water quality requirements of existing and anticipated state and federal drinking water regulations in a cost-effective, environmentally sensitive manner. The SFPUC water supply system currently uses chlorination for both primary and residual disinfection. The proposed project would involve a sequential disinfection strategy, where chlorine would be used for primary disinfection and would be followed by chloramine as the residual disinfectant.

The process of forming chloramine for disinfection of water is called chloramination. Chloramine is a combination of chlorine and ammonia. Like chlorine, it acts as a disinfectant, but is more stable, persists longer in the distribution system, and is less reactive than chlorine and so it forms very low levels of disinfection by-products. Chlorine would still be used for primary disinfection, because it is a much stronger biocide than chloramine. Chloramine, however, would be used for residual disinfection and would remain in the distribution system to prevent bacterial regrowth.

An ancillary objective of the proposed project is to comply with requirements of the California Regional Water Quality Control Board for protection of aquatic systems and surface water bodies. While disinfection of the drinking water is necessary to protect public health, discharge of chlorinated or chloraminated water can cause adverse effects to aquatic organisms and surface water bodies. Therefore, the proposed project also includes some facilities and processes for removing chlorine and/or ammonia at various locations along the system to protect local water quality.

In order to be compatible with the SFPUC water supply system, the proposed project would require construction of new facilities at four main locations: Tesla Portal, San Antonio Pump Station, an area south of the Pulgas Water Temple, and Harry W. Tracy Water Treatment Plant (WTP) (see Figure III-1). The types of facilities proposed include some new structures (such as chemical storage and operation buildings), new access roads, and new pipelines to connect to the existing water system. All proposed improvements would be constructed on lands currently owned by the City and County of San Francisco, adjacent to existing water system facilities.

New facilities proposed at the Tesla Portal site include a chlorine storage and feed facility, a water supply pipeline, and access road. Three new facilities are proposed near the San Antonio Pump Station in the Sunol Valley: an ammonia and chlorine feed facility and two dechlorination facilities (one at Alameda East Portal and one at Alameda West Portal). At the Pulgas site, a new dechloramination facility would be constructed to remove chlorine and reduce ammonia levels prior to discharge of SFPUC system water to Crystal Springs Reservoir. This facility would include an aboveground chemical storage structure and operations building, below-ground

contactor basin, access road and truck turnaround, and buried pipes to carry chemicals and to circulate treated water. Some modifications would also be made to inlet and outlet structures at the Pulgas Balancing Reservoir to improve circulation. At the Harry W. Tracy WTP, new chlorine and ammonia storage and feed facilities would be built. In addition, a permanent dechlorination facility would be built at the WTP to replace the portable dechlorination trailer that is currently used at this site. This EIR analyzes the potential environmental impacts associated with these project components at a project level, since detailed engineering and design information is available.

In addition to the components described above, the proposed project would require some new facilities or modifications to existing facilities at other locations along the SFPUC water supply system or within the SFPUC service area. These other locations include the treated water reservoirs in San Francisco (part of the SFPUC City Distribution Division); secondary discharge sites at various locations along the water system, where drinking water is discharged either incidentally or intentionally to surface water bodies; and the facilities and distributions systems associated with the member agencies of the Bay Area Water Users Association (BAWUA). Since detailed engineering and design information is not currently available for these components, they are analyzed at a program, or more general, level. Depending on site-specific design and siting conditions, some aspects of these project components could require additional environmental review subsequent to this EIR, when site-specific information becomes available.

Construction of the proposed water treatment facilities at the four main locations would cover areas ranging from approximately 900 to 20,000 square feet, on sites of 0.1 to 10 acres. Construction duration for the proposed facilities would vary by site, but would range between 2 and 14 months. Pile driving would not be required at any of the facilities. Construction at all facility sites would be accomplished using standard surface construction methods and would comply with applicable environmental regulations for construction activities. Estimated capital costs for the proposed project total approximately $40 million.

Final design of the project is scheduled for completion in 2001, and construction completed by early 2003. The last 12 months of the construction period would also include startup activities at new facility sites, initial cleaning of water storage reservoirs, distribution system flushing, and a formal public information outreach program.

C. SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION

- Chapter IV of this EIR presents a description of the existing environmental setting and an analysis of environmental impacts. The impact analysis indicates that at all project sites, all identified environmental impacts can be mitigated to a less than significant level. There would be no significant, unavoidable adverse impacts associated with construction and operation of the proposed project. Impacts are identified as either "significant but can be mitigated," "potentially significant but can be mitigated," "less than significant," or "beneficial." In some cases, impacts do not apply at all sites and therefore are not applicable. Table I-1, located at the end of this chapter, presents a summary of all identified impacts.

To summarize the information on a site-by-site basis, the EIR identifies the following significant or potentially significant impacts:

Site	Number of Significant or Potentially Significant Impacts	Impacts related to:
Tesla Portal	6	biological, cultural, geologic
San Antonio Pump Station	5	biological, cultural, geologic
Alameda East Portal	5	biological, cultural, geologic
Alameda West Portal	5	biological, cultural, geologic
Pulgas Site	13	land use, biological, aesthetics, cultural, geologic
Pulgas Balancing Reservoir	1	geologic
Harry W. Tracy WTP	6	biological, water quality, cultural, geologic, hazards

Beneficial impacts on public health and water supply related to increased reliability and to improvement in taste and odor are also identified. The proposed project would improve health protection by consistently reducing disinfectant by-product concentrations. All of the remaining impacts associated with the proposed project are determined to be less than significant or not applicable.

- For all significant or potentially significant impacts, Chapter V of the EIR presents mitigation measures that would reduce impacts to less than significant. Measures are described in two categories, those already included as part of the proposed project and those identified in the EIR. The SFPUC would need to make a determination as to which of the mitigation measures it would adopt prior to approving the proposed project. In addition, the EIR identifies improvement measures that are recommended to reduce disruption or minor adverse effects of the proposed project, but are not required to reduce impacts to a less than significant level. A brief summary of the significant and potentially significant impacts and mitigation measures that would reduce impacts to less than significant, is presented below.

Plans and Policies

No significant or potentially significant impacts are identified, and no mitigation is required.

Land Use and Recreation

1) *Impact on the existing character of a community* – The addition of the 20,000-square-foot building at the Pulgas Water Temple site could detract from the largely natural setting, since the building would be visible from Cañada Road. Mitgations are included under the heading "Aesthetics."

Biological Resources

1) *Wetland impacts* – The project could cause disturbance of drainages that are potentially subject to U.S. Army Corps of Engineers jurisdiction (at the Tesla Portal, San Antonio Pump Station, and Alameda East Portal sites). There could be disturbance (at the Pulgas site) of a creek under Corps jurisdiction, and of a grassland site that may be jurisdictional. Conducting a wetland delineation at these sites and either avoiding the wetlands or complying with applicable regulations would mitigate these impacts.

2) *Special-status species impacts* – At Tesla Portal, the project could affect the burrowing owl and the San Joaquin kit fox. At the Alameda West Portal, the project could affect the California tiger salamander. At the Pulgas site, the project could affect the California red-legged frog, San Francisco garter snake, and/or special-status bats. Conducting preconstruction surveys to identify habitat, implementing procedures to avoid or minimize disturbance to these species and their habitat, and complying with applicable regulations would mitigate these impacts.

3) *Aquatic habitat impacts* – At the Harry W. Tracy WTP, overflows of ammoniated water into the San Andreas Reservoir could promote algal growth and affect aquatic habitats. Monitoring overflows and conducting nutrient management practices would mitigate this impact.

4) *Nesting raptors and passerine bird impacts* – Project construction at the San Antonio Pump Station, Alameda East Portal, Alameda West Portal, and Pulgas sites could destroy young birds and reduce population numbers. Avoiding tree and brush removal during the nesting season would mitigate these impacts.

5) *Vegetation communities impacts* – The project would require removal of willow riparian habitat at the Pulgas site. Avoiding the habitat or replacing the habitat at an approved ratio would mitigate this impact.

6) *Invasive landscape plant species impacts* – Landscaping species, if invasive, could reduce native species at the Pulgas site. Removal of invasive species and revegetating with native species would mitigate this impact.

Hydrology and Water Quality

1) *Operational discharge impact to water quality* – Overflows of ammoniated water from Harry W. Tracy WTP into the San Andreas Reservoir could promote algal growth and affect water quality. As discussed above under "Biological Resources, Aquatic Habitat Impacts," monitoring overflows and conducting nutrient management practices would mitigate this impact.

1) *Secondary systems releases* – If drinking water transfers to Lake Merced were to continue after chloramine conversion is implemented, there is the potential for residual ammonia to promote algal growth and affect water quality. Conducting a water quality study to

determine the nitrogen loading effects on Lake Merced and implementing study recommendations would mitigate this impact.

1) *Operational discharge impact to water quality from BAWUA agencies' systems* – Planned or unplanned releases of chloraminated water into water bodies from BAWUA agencies systems could affect water quality of local surface water bodies. To mitigate this impact, BAWUA member agencies should conduct a comprehensive evaluation of their individual systems to determine specific water quality control measures that would prevent discharge of harmful substances to local water bodies.

Public Health and Water Supply

No significant or potentially significant impacts are identified, and no mitigation is required.

Aesthetics

1) *Negative aesthetic impact* – The project would place a non-natural facility in a scenic rural area at the Pulgas site and remove mature trees along Cañada Road near the site. Incorporating architectural elements that would blend with the surrounding area into the building design, designing and implementing a landscape and screening plan, and restoring disturbed landscaping would mitigate this impact.

2) *Degradation or obstruction of scenic views* – The construction of the Pulgas Dechloramination Facility would degrade scenic views from public areas at the Pulgas site. Incorporating design elements to minimize the non-natural appearance, constructing a decorative screening gate, retaining as much vegetation along Cañada Road as possible, and planting additional trees would mitigate this impact.

Cultural Resources

1) *Construction impacts to archaeological resources* – At all of the project sites (except the Pulgas Balancing Reservoir), construction activities could damage, disrupt, or adversely affect unknown buried cultural resources. Providing a contingency plan for cultural resources in the event of an inadvertent discovery and implementing the plan as necessary would mitigate this impact.

2) *Construction impacts to architectural resources* – Architectural resources at the Pulgas Water Temple could be affected by construction, due to dust and vibration and to removal of vegetation and land contours. Inspecting the temple prior to construction, implementing recommendations to protect the structure, cleaning the temple after construction, if necessary, and maintaining and restoring in-place landscaping would mitigate this impact.

3) *Operational impacts to architectural resources* – The proposed project would disrupt the sound of flowing water at the Pulgas Water Temple, which is one of the historic features of the temple. Providing a system such as a recirculating pump to mimic the sound of flowing water through the temple would mitigate this impact.

Geology and Seismicity

1) *Seismic hazard / ground rupture* – Due to the proximity to active or inactive earthquake faults, there is the potential for ground rupture or deformation at the Tesla Portal, San Antonio Pump Station, Alameda East Portal, Alameda West Portal, and Pulgas sites. Conducting a fault investigation and incorporating engineering recommendations in the site design would mitigate this impact.

2) *Seismic hazard / ground shaking* – Severe ground shaking is likely at every project site due to the moderate to high probability of earthquakes along nearby fault lines. Conducting geotechnical investigations and incorporating engineering recommendations in the site design would mitigate this impact.

3) *Unstable cut-and-fill slopes* – At the Tesla Portal and Harry W. Tracy WTP sites, construction on a hillside could result in an unstable cut-and-fill slope. Conducting geotechnical investigations and incorporating engineering recommendations in the site design would mitigate this impact.

Hazardous Materials

1) *Chemicals in soil* – Construction at Harry W. Tracy WTP could encounter hazardous materials in soils from a previously identified spill. Reviewing underground storage tank records, providing a contingency plan for management during construction, and implementing the plan as necessary would mitigate this impact.

Transportation

No significant or potentially significant impacts are identified, and no mitigation is required.

Noise

No significant or potentially significant impacts are identified, and no mitigation is required.

D. OTHER TOPICS

1.0 GROWTH INDUCEMENT

Implementation of the proposed project would not result in growth-inducing effects, either directly or indirectly. While some construction of new facilities (such as pipelines and access roads) would occur, these improvements would be localized at existing facility locations. All project components relate directly to the chloramination conversion process, and there would be no off-site extension of water supply or distribution lines. No new population growth would be accommodated, because the proposed project would not increase the overall capacity of the SFPUC water system, nor would the SFPUC expand the water system throughout its service area. The project would constitute a continuation of an existing use. It would not alter surrounding land use patterns or encourage increased development in the vicinity of any of the four project

facility locations (Tesla Portal, San Antonio Pump Station, Pulgas area, and Harry W. Tracy WTP).

2.0 CUMULATIVE ENVIRONMENTAL EFFECTS

The EIR examines related projects that could, in combination with the proposed project, result in considerable cumulative environmental effects. Generally, development projects in the vicinity of the project locations would be within SFPUC-owned lands. The SFPUC's Capital Improvement Program identifies other reasonably foreseeable future projects that could occur in the project vicinity within a similar timeframe. Several projects are planned in the vicinity of the Pulgas site, the Harry W. Tracy WTP site, and the Sunol Valley area. Cumulative construction-related impacts could occur if these other planned projects were to coincide with the construction of facilities related to the chloramine conversion project; and cumulative long-term impacts could occur if these planned projects affected overlapping environmental resources. The individual projects within the Capital Improvement Program are subject to separate environmental review processes. A variety of mitigation measures have been included in the project description and recommended in this report to ensure that the proposed project would not contribute to any potentially significant cumulative impacts.

At the Pulgas site, three separate SFPUC projects, including the proposed project, could contribute to the cumulative loss of the San Francisco garter snake or California red-legged frog and to degradation of suitable habitat. The SFPUC has initiated consultation and coordination with the U.S. Fish and Wildlife Service to address potential cumulative habitat impacts. However, the proposed project would avoid contributing to the cumulative loss or degradation of suitable habitat for these species through mitigation measures identified in this EIR. Therefore, the project's contribution to this potential cumulative impact would be reduced to a less than significant level. In addition, the three SFPUC projects could result in cumulative increases in construction traffic and noise as well as disruption of recreational uses in the Pulgas site vicinity during construction, depending on the construction schedules for the projects. However, because the construction-related disruption would be temporary and the projects may not necessarily overlap, these impacts would be considered less than significant.

Potential cumulative increases in construction-related traffic near the Harry W. Tracy WTP could occur on Crystal Springs Road; however, these would be less than significant due to their short-term nature and the relatively low amounts of construction traffic expected. Similarly, cumulative increases in noise in this area would be less than significant, because of the short-term nature and the large setback distances between facilities and the nearest receptors.

In the Sunol Valley area, two alternative sites under consideration for the Sunol Valley Water Treatment Plant Improvement Project include the Alameda East and West Portal sites, which could contribute to cumulative impacts when considered in conjunction with the proposed project. Since the area is known habitat for sensitive species, including the California red-legged frog and California tiger salamander, the projects in the Sunol Valley area could have individual or cumulative impacts on sensitive species. These impacts would be determined in the future when environmental review of all related projects is completed. However, because the proposed

Chloramine Conversion project individually would not have any unavoidable impacts on special-status species, the project's contribution to any sensitive species impacts would not be cumulatively considerable. Construction of the proposed facilities for the Sunol Valley Water Treatment Plant Improvement Project would not occur until 2007 at the earliest, about four years after the scheduled completion of the proposed project, so no cumulative construction impacts would occur.

3.0 SIGNIFICANT, UNAVOIDABLE ENVIRONMENTAL EFFECTS

No significant, unavoidable environmental effects of the project have been identified.

This EIR evaluates potential environmental impacts for various aspects of project implementation at either the program or project level, based on the availability of detailed design information at this time. Project-level analysis was completed for proposed new facilities at Tesla Portal, San Antonio Pump Station, Alameda East and Alameda West Portals, the Pulgas area, Pulgas Balancing Reservoir, and Harry W. Tracy WTP. Potentially significant impacts associated with these facilities would be reduced to a less than significant level with implementation of mitigation measures that have been incorporated into the project description or recommended in this report.

Other components of the proposed project, for which detailed engineering and design information is not yet available, were examined at the program level. Based on the information available to date, no significant, unavoidable impacts have been identified. Depending upon site-specific conditions and design details, some aspects of these project components could require additional environmental review at a later date, when site-specific information becomes available. The need for additional environmental review for specific SFPUC project components would be determined by SFPUC and San Francisco Planning Department staff, while environmental review for projects associated with BAWUA member agencies would be determined by the appropriate agency or jurisdiction in those locations.

4.0 SIGNIFICANT, IRREVERSIBLE ENVIRONMENTAL CHANGES

Project construction and operational impacts would result in an irretrievable and irreversible commitment of natural resources through use of fossil fuels or construction materials. Operation of project facilities would incrementally increase power consumption associated with Hetch Hetchy water treatment facilities. The project's incremental increased use of these resources, however, would not significantly increase the overall commitment of resources associated with water treatment. Since the project would involve only minor incremental use of nonrenewable resources, would locate facilities on lands already committed for water supply purposes, and would provide a high level of public health protection against potential accidents, it would not result in significant and irreversible environmental changes.

5.0 ALTERNATIVES

The SFPUC has conducted extensive studies on its water supply system related to improving reliability to meet current and proposed water quality regulations. These studies have identified a

wide variety of measures that could be taken to help achieve these goals, including alternative treatment facilities or processes for disinfection, corrosion control, ozonation, and filtration. Based on these studies, chloramine conversion was determined to be the only disinfection method that could reliably meet current and proposed regulatory requirements. Thus, the No Project Alternative, as well as other disinfection alternatives evaluated, would not achieve the objectives of the proposed project.

While alternative siting of proposed chloramination facilities could meet project objectives, environmental analysis indicated that other facility siting alternatives would result in more physical impacts to the environment and more impacts on sensitive biological resources. Therefore, the proposed project was determined to be the environmentally preferred alternative.

TABLE I-1
SUMMARY OF ENVIRONMENTAL IMPACTS

		Sunol Valley Sites			Pulgas Sites			
LAND USE AND RECREATION	**Tesla Portal Site**	**San Antonio Pump Station Site**	**Alameda East Portal Site**	**Alameda West Portal Site**	**Pulgas Site**	**Pulgas Balancing Reservoir Site**	**Harry W. Tracy WTP Site**	**Secondary Discharge Locations**
Impact								
Disruption or division of an established community	LS	LS	LS	LS	LS	LS	LS	LS
Conflicts with established uses	LS	LS	LS	LS	LS	LS	LS	LS
Impact on the existing character of a community	LS	LS	LS	LS	PSM: Addition of 20,000-square-foot building, visible from Cañada Road; could detract from largely natural setting	LS	LS	LS

SM = Significant Impact, can be Mitigated
PSM = Potentially Significant Impact, can be Mitigated
B = Beneficial

LS = Less than Significant Impact
SU = Significant Unavoidable Impact
N/A = Not Applicable

TABLE I-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS

BIOLOGICAL RESOURCES	Tesla Portal Site	Sunol Valley Sites			Pulgas Sites		Harry W. Tracy WTP Site	Secondary Discharge Locations
		San Antonio Pump Station Site	Alameda East Portal Site	Alameda West Portal Site	Pulgas Site	Pulgas Balancing Reservoir Site		
Impact								
Wetland impacts	PSM: Disturbance of a drainage that is potentially subject to Corps jurisdiction	PSM: Disturbance of two drainages that are potentially subject to Corps jurisdiction	PSM: Disturbance of a drainage that is potentially subject to Corps jurisdiction	N/A	PSM: Disturbance of creek under Corps jurisdiction, and of grassland that may in part be jurisdictional	N/A	N/A	N/A
Special-status species impacts	PSM: Temporary project construction disturbance of nesting burrowing owl and San Joaquin kit fox	N/A	N/A	PSM: Potential for destruction of individual California tiger salamanders and of aestivation habitat during construction	SM: Disruption of habitat/destruction of individual California red legged frogs and S.F. garter snakes. PSM: Potential disruption of special-status bat habitat	N/A	N/A	N/A
Common species impacts	LS	LS	LS	LS	LS	N/A	N/A	N/A
Tree impacts	N/A	N/A	N/A	N/A	LS	N/A	N/A	N/A

SM = Significant Impact, can be Mitigated
PSM = Potentially Significant Impact, can be Mitigated
B = Beneficial

LS = Less than Significant Impact
SU = Significant Unavoidable Impact
N/A = Not Applicable

TABLE I-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS

BIOLOGICAL RESOURCES (cont.)		Sunol Valley Sites			Pulgas Sites			
	Tesla Portal Site	San Antonio Pump Station Site	Alameda East Portal Site	Alameda West Portal Site	Pulgas Site	Pulgas Balancing Reservoir Site	Harry W. Tracy WTP Site	Secondary Discharge Locations
Impact								
Aquatic habitat impacts	N/A	LS	LS	LS	LS	LS	PSM: Potential algal growth from ammoniated water overflow into San Andreas Reservoir	LS
Nesting raptor and passerine bird impacts	N/A	PSM: Construction activities could destroy birds and reduce population	PSM: same as San Antonio Pump Station	PSM: same as San Antonio Pump Station	PSM: same as San Antonio Pump Station	N/A	N/A	N/A
Vegetation communities impacts	N/A	N/A	N/A	N/A	SM: Construction would require removal of willow riparian habitat	N/A	N/A	N/A
Invasive landscape plant species impacts	N/A	N/A	N/A	N/A	PSM: Landscape species, if invasive, could reduce native species	N/A	N/A	N/A

SM = Significant Impact, can be Mitigated
PSM = Potentially Significant Impact, can be Mitigated
B = Beneficial

LS = Less than Significant Impact
SU = Significant Unavoidable Impact
N/A = Not Applicable

TABLE I-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS

HYDROLOGY AND WATER QUALITY	Tesla Portal Site	Sunol Valley Sites: San Antonio Pump Station Site	Sunol Valley Sites: Alameda East Portal Site	Sunol Valley Sites: Alameda West Portal Site	Pulgas Sites: Pulgas Site	Pulgas Sites: Pulgas Balancing Reservoir Site	Harry W. Tracy WTP Site	Secondary Discharge Locations
Impact								
Construction impact to water quality	LS	LS	LS	LS	LS	LS	LS	LS
Operational discharge impact to water quality	N/A	N/A	LS	LS	LS	LS	PSM: Potential for overflows of ammoniated water into San Andreas Reservoir to promote algal growth	PSM: Potential for discharges of ammoniated water to promote algal growth
System failure impact to water quality	N/A	LS	LS	LS	LS	N/A	LS	LS
Chemical spill impact to water quality	LS	LS	LS	LS	LS	N/A	LS	LS
Impact to facilities from flooding	N/A	LS	N/A	N/A	LS	N/A	N/A	N/A
Increase in stormwater runoff	LS	LS	LS	LS	LS	N/A	LS	LS
Secondary systems releases	PSM: Lake Merced – Potential for planned discharges of ammoniated water to promote algal growth							
Operational discharges from BAWUA agencies' systems	PSM: Systemwide – Potential for discharges of chloraminated water to affect water quality							
End use of chloraminated water	LS: Systemwide							

SM = Significant Impact, can be Mitigated
PSM = Potentially Significant Impact, can be Mitigated
B = Beneficial

LS = Less than Significant Impact
SU = Significant Unavoidable Impact
N/A = Not Applicable

TABLE I-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS

PUBLIC HEALTH AND WATER SUPPLY	City Distribution Division System	BAWUA Member Agency Systems
Impact		
Increased reliability	B: Improves public health protection by consistently reducing disinfectant by-product concentrations	B: Improves public health protection by consistently reducing disinfectant by-product concentrations
Change in taste and odor	B: Reduces taste and odor of chlorine	B: Reduces taste and odor of chlorine
Effect on dialysis patients	LS	LS
Aquarium and pond impacts	LS	LS
Effects on sensitive users	LS	LS
BAWUA system impacts	N/A	LS

SM = Significant Impact, can be Mitigated
PSM = Potentially Significant Impact, can be Mitigated
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N/A = Not Applicable

TABLE I-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS

		Sunol Valley Sites			Pulgas Sites			
AESTHETICS	**Tesla Portal Site**	**San Antonio Pump Station Site**	**Alameda East Portal Site**	**Alameda West Portal Site**	**Pulgas Site**	**Pulgas Balancing Reservoir Site**	**Harry W. Tracy WTP Site**	**Secondary Discharge Locations**
Impact								
Negative aesthetic effect	LS	LS	LS	LS	PSM: Project would place non-natural facility in scenic, rural area and remove mature trees along Cañada Road	LS	LS	N/A
Degradation or obstruction of scenic views	LS	LS	LS	LS	PSM: View of dechloramination facility would degrade scenic views from public areas	LS	LS	N/A
Production of substantial light or glare	LS	LS	LS	LS	LS	LS	LS	N/A

SM = Significant Impact, can be Mitigated
PSM = Potentially Significant Impact, can be Mitigated
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N/A = Not Applicable

TABLE I-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS

CULTURAL RESOURCES		Sunol Valley Sites			Pulgas Sites			
	Tesla Portal Site	San Antonio Pump Station Site	Alameda East Portal Site	Alameda West Portal Site	Pulgas Site	Pulgas Balancing Reservoir Site	Harry W. Tracy WTP Site	Secondary Discharge Locations
Impact								
Construction impacts to archaeological resources	PSM: Construction activities could damage, disrupt, or adversely affect unknown buried cultural resources	PSM: same as Tesla Portal site	PSM: same as Tesla Portal site	PSM: same as Tesla Portal site	PSM: same as Tesla Portal site	N/A	PSM: same as Tesla Portal site	N/A
Construction impacts to architectural resources	LS	LS	LS	LS	PSM: Dust, noise, and vibrations from construction activities could affect Water Temple. Existing vegetation and land contours would be disturbed	LS	LS	N/A
Operational impacts to architectural resources	LS	LS	LS	LS	PSM: Project would disrupt the sound of flowing water at the Pulgas Water Temple	LS	LS	N/A

SM = Significant Impact, can be Mitigated
PSM = Potentially Significant Impact, can be Mitigated
B = Beneficial

LS = Less than Significant Impact
SU = Significant Unavoidable Impact
N/A = Not Applicable

TABLE I-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS

GEOLOGY AND SEISMICITY	Tesla Portal Site	Sunol Valley Sites			Pulgas Sites		Harry W. Tracy WTP Site
		San Antonio Pump Station Site	Alameda East Portal Site	Alameda West Portal Site	Pulgas Site	Pulgas Balancing Reservoir Site	
Impact							
Seismic hazard – ground rupture	PSM: Potential for ground deformation in a quake event along San Joaquin fault	SM: Trace of Calaveras fault may be within 50 feet of proposed facility, potential ground rupture	PSM: Potential for ground rupture in the event of quake along Calaveras fault	PSM: Low potential for ground rupture in a quake event of the inactive Sinbad fault	PSM: Potential for ground rupture in the event of quake along Cañada fault	LS	LS
Seismic hazard – ground shaking	PSM: Low to moderate major earthquake probability on San Joaquin fault	SM: High major earthquake probability on Calaveras fault	SM: High major earthquake probability on Calaveras fault	SM: High major earthquake probability on Calaveras fault	SM: High major earthquake probability on San Andreas fault	SM: High major earthquake probability on San Andreas fault	SM: High major earthquake probability on San Andreas fault
Seismic hazard – liquefaction	LS	LS	LS	LS	LS	LS	LS
Seismic hazard – landslides	LS	LS	LS	LS	LS	LS	LS
Loss of Mineral Resources	N/A	LS	LS	LS	N/A	N/A	LS
Unstable cut-and-fill slopes on hillsides	PSM: Construction of roadway could result in unstable cut-and-fill slope	N/A	N/A	N/A	N/A	N/A	PSM: Construction of ammonia feed building could result in unstable cut-and-fill slope

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SU = Significant Unavoidable Impact
N/A = Not Applicable

TABLE I-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS

HAZARDOUS MATERIALS	Tesla Portal Site	Sunol Valley Sites			Pulgas Sites		Harry W. Tracy WTP Site
		San Antonio Pump Station Site	Alameda East Portal Site	Alameda West Portal Site	Pulgas Site	Pulgas Balancing Reservoir Site	
Impact							
Accidental release of stored chemicals	LS	LS	LS	LS	LS	N/A	LS
Chemicals in soil	LS	LS	LS	LS	LS	LS	PSM: Potential to encounter hydrocarbons from identified spill from underground storage tank
Release of chemicals from construction equipment	LS	LS	LS	LS	LS	LS	LS
Hazardous building materials	LS	N/A	N/A	N/A	N/A	N/A	N/A

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LS = Less than Significant Impact
SU = Significant Unavoidable Impact
N/A = Not Applicable

TABLE I-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS

		Sunol Valley Sites			Pulgas Sites			
TRANSPORTATION	**Tesla Portal Site**	**San Antonio Pump Station Site**	**Alameda East Portal Site**	**Alameda West Portal Site**	**Pulgas Site**	**Pulgas Balancing Reservoir Site**	**Harry W. Tracy WTP Site**	**Secondary Discharge Locations**
Impact								
Vehicle trip generation	N/A	N/A	N/A	N/A	LS	N/A	N/A	N/A
Traffic safety impacts from construction and operational traffic	N/A	N/A	N/A	N/A	LS	N/A	N/A	N/A

SM = Significant Impact, can be Mitigated
PSM = Potentially Significant Impact, can be Mitigated
B = Beneficial

LS = Less than Significant Impact
SU = Significant Unavoidable Impact
N/A = Not Applicable

TABLE I-1 (Continued)
SUMMARY OF ENVIRONMENTAL IMPACTS

		Sunol Valley Sites			Pulgas Sites			
NOISE	**Tesla Portal Site**	**San Antonio Pump Station Site**	**Alameda East Portal Site**	**Alameda West Portal Site**	**Pulgas Site**	**Pulgas Balancing Reservoir Site**	**Harry W. Tracy WTP Site**	**Secondary Discharge Locations**
Impact								
Construction noise impacts	LS	LS	LS	LS	LS	LS	LS	LS
Operational noise impacts	LS	LS	LS	LS	LS	LS	LS	LS

SM = Significant Impact, can be Mitigated
PSM = Potentially Significant Impact, can be Mitigated
B = Beneficial
LS = Less than Significant Impact
SU = Significant Unavoidable Impact
N/A = Not Applicable

CHAPTER II
INTRODUCTION AND BACKGROUND

A. INTRODUCTION

The San Francisco Public Utilities Commission (SFPUC) is proposing that the residual disinfectant for the water supply system be converted from chlorine to chloramine, a combination of chlorine and ammonia. The project that proposes this conversion is referred to as the Hetch Hetchy Water Treatment Project--Chloramine Conversion. The process of using chloramine for disinfection is referred to as "chloramination." The overall intent of the proposed project is to improve the reliability of the SFPUC drinking water supply system to meet water quality requirements of the Stage 1 Disinfectants and Disinfection By-Products Rule, a federal drinking water regulation adopted by the U.S. Environmental Protection Agency (USEPA), which became effective in 1999. Chloramination of the drinking water supply would increase public health protection by reducing exposure to potentially harmful disinfection by-products.

In addition to modifying the residual disinfection system, the proposed project would include facilities to remove chlorine and/or ammonia from the SFPUC water supply system to protect surface water quality at various locations along the system. These facilities would be located at sites where the SFPUC discharges portions of the drinking water supply to creeks, reservoirs, or other surface water bodies. Removal of chlorine from water is referred to as "dechlorination," and removal of both chlorine and ammonia is referred to as "dechloramination." Proposed dechlorination and dechloramination facilities would be designed to comply with state water quality regulations adopted by the California Regional Water Quality Control Board (RWQCB).

The proposed project would require construction of facilities at multiple locations along the SFPUC water supply system, including locations in San Joaquin, Alameda, San Mateo, and San Francisco Counties. In addition, the project may require physical and/or operational modifications to the water distribution systems in the SFPUC service area. The project would affect water supply customers in San Francisco as well as customers of the member agencies of the Bay Area Water Users Association (BAWUA) who purchase drinking water wholesale from the SFPUC and non-BAWUA customers who purchase retail drinking water from the SFPUC.

The San Francisco Planning Department prepared and distributed an Initial Study on the proposed project on November 19, 1999, in accordance with requirements of the California Environmental Quality Act (CEQA). The Initial Study concluded that this project may have a significant effect on the environment and that an environment impact report (EIR) is required. The Initial Study is included as Appendix A to this report. The Initial Study examined the potential effects of the proposed project on the environment for all project locations and determined that at some project locations, some impact areas would be either insignificant or mitigable to less than significant

through project design. The following impact areas are discussed in the Initial Study and are not examined further in the EIR for that reason: population, air quality, energy and natural resources, and utilities and public services. Aesthetics, transportation, and noise impacts were determined to be less than significant for some of the sites and are not addressed further for those sites.

This document is the EIR on the Hetch Hetchy Water Treatment Project--Chloramine Conversion and has been prepared in accordance with CEQA to fulfill that requirement. The EIR focuses on the impact areas and sites that were identified in the Initial Study to be potentially significant. These impact areas examined at one or more project sites in the EIR are: land use and recreation, biological resources, hydrology and water quality, public health, aesthetics (visual quality), cultural resources, geology and seismicity, hazardous materials, transportation, and noise.

B. BACKGROUND

The SFPUC is responsible for providing a safe and reliable drinking water supply for 2.4 million customers in the City and County of San Francisco (the City) and portions of San Mateo, Santa Clara, and Alameda Counties. This water supply, referred to as the SFPUC water supply system, originates from three sources: Tuolumne River in the Sierra Nevada mountains, local runoff from watersheds in Alameda and Santa Clara Counties, and local runoff from watersheds in San Mateo County. The water is conveyed about 150 miles through a series of aqueducts, pipelines, tunnels, and reservoirs to the SFPUC service area in the Bay Area. The water supply receives the necessary treatment to meet existing water quality and public health requirements before it is distributed to the public.

The SFPUC has conducted extensive studies on the SFPUC water supply system for over a decade to determine the treatment processes and facilities needed to continue to meet existing state and federal drinking water regulations as well as to meet anticipated future regulations (San Francisco Water Team, 1996). The studies included water quality testing and monitoring, in addition to identification and evaluation of alternative treatment methods and facilities needed for any improvements. Specifically, the studies focused on treatment and facilities needs related to disinfection, corrosion control, ozonation, and filtration processes.

Results of these studies determined that the current disinfection method for the water supply system would not reliably meet the federal Disinfectants and Disinfection By-Products Rule (Camp Dresser & McKee, 1995). The studies concluded that the residual disinfectant should be converted from chlorine to chloramine to reliably lower disinfection by-products to levels below the maximum levels mandated in this new regulation. Chlorine for primary disinfection followed by chloramine for residual disinfection was recommended as the most reliable and cost-effective method to meet these new requirements. This disinfection sequencing method is being used successfully by numerous utility districts nationwide, including the following Bay Area utilities: East Bay Municipal Utility District, Alameda County Water District, Santa Clara Valley Water District, Contra Costa Water District, and Marin Municipal Water District. Therefore, the SFPUC initiated the Hetch Hetchy Water Treatment Project--Chloramine Conversion, which is the subject of this EIR (San Francisco Water Team, 1999).

- The purpose of the EIR is to assess potential environmental impacts associated with the proposed project, to identify mitigation measures, to compare alternatives to the project, and to provide overall public disclosure of the environmental effects of the project. The San Francisco Planning Department, as the lead agency under CEQA, is responsible for the EIR and the environmental review process, and the San Francisco Planning Commission has certified this EIR as accurate and complete; therefore, the SFPUC can take action on the proposed project. The certified EIR serves as one source of information to assist the SFPUC in determining whether or not to approve or modify the proposed project.

Due to the extent and complexity of the SFPUC water supply system, some components of the proposed project have been studied and designed in more detail than others. For those components for which the SFPUC has developed preliminary design and construction information, this EIR provides a site-specific, detailed analysis, referred to as a "project-level" analysis of potential environmental effects. Following certification of the EIR and approval of the project, the SFPUC may proceed with construction and implementation of project components that have been analyzed at a project level. However, there are some components of the proposed project that have not yet been fully studied and for which site-specific design information is not available. For those components, this EIR provides a more general or "program level" of analysis. Further environmental review subsequent to this EIR may be required for those project components prior to their construction and implementation.

C. REGULATORY FRAMEWORK

1.0 SAFE DRINKING WATER ACT

The federal Safe Drinking Water Act, as amended in 1986, is the nation's major law regulating drinking water quality, and it is implemented by the USEPA. The Safe Drinking Water Act established primary and secondary drinking water regulations, and implementation and enforcement of this act has been delegated to the states. This act promulgates primary drinking water regulations that specify a maximum contaminant level (MCL) for any contaminant that "may have any adverse effect on the health of persons and which is known or anticipated to occur in public water systems" (USEPA, 1986).

In California, the Safe Drinking Water Act is under the jurisdiction of the California Department of Health Services, Division of Drinking Water and Environmental Management. MCLs established for primary and secondary drinking water standards are enforceable regulatory levels and must be met by all public drinking water systems. Primary MCLs are established for a number of chemical and radioactive contaminants, including inorganic chemicals, trihalomethanes, radioactivity, and organic chemicals. Secondary MCLs are established for chemicals or water characteristics that are set for taste, odor, or appearance of drinking water (State of California, *California Code of Regulations*, Title 22).

The amended Safe Drinking Water Act established phases of regulation and a number of regulatory deadlines to address drinking water requirements. This amended act is being

implemented through subsidiary rules for regulation of specific contaminants or for monitoring or treatment requirements. Federal rules for public drinking water supplies under the amended Safe Drinking Water Act include the Total Coliform Rule (1989), Surface Water Treatment Rule (1989), Lead and Copper Rule (1991), Information Collection Rule (1996), Interim Enhanced Surface Water Treatment Rule (1998), and the Stage 1 Disinfectants and Disinfection By-Products Rule (1998); a Stage 2 Rule and an Enhanced Surface Water Treatment Rule are anticipated in the future. The purpose of the proposed project is to achieve compliance with the Disinfectants and Disinfection By-Products Rule, while also preparing for the requirements of the associated existing or future regulations listed above. The Disinfectants and Disinfection By-Products Rule, referred to throughout this document as the D/DBP Rule, is described in more detail below.

2.0 DISINFECTANTS / DISINFECTION BY-PRODUCT RULE

The Stage 1 D/DBP Rule was adopted in December 1998 and became effective in February 1999 (USEPA, 1998). The Stage 1 D/DBP Rule reduces the maximum allowable levels of disinfectants and disinfection by-products in drinking water supplies. The intent of the rule is to provide increased public health protection from exposure to potentially harmful disinfection by-products.

Disinfection is the treatment process used to inactivate and destroy disease-causing bacteria, viruses, and other waterborne microorganisms. Chlorine, a commonly and historically used disinfectant in drinking water, provides a high degree of public health protection from bacteria and viruses. However, in 1974 it was discovered that chlorine reacts with natural organic and inorganic matter in water to form disinfection by-products. The major groups of disinfection by-products produced by chlorination are trihalomethanes and haloacetic acids, and these by-products have been shown to cause health effects in laboratory animals. Thus, based on numerous toxicological studies, the USEPA adopted this rule to lower the public health risk associated with exposure to disinfection by-products. The MCLs for disinfection by-products established in the Stage 1 D/DBP Rule are shown in Table II-1.

The SFPUC is required to comply with the Stage 1 D/DBP Rule within three years from promulgation of the rule, though the State of California may grant the SFPUC an additional two years to comply if capital improvements are needed. The D/DBP Rule also includes requirements for monitoring, reporting, and public notification.

The Stage 2 D/DBP Rule is currently in process and would tentatively lower the MCLs for disinfection by-products to more stringent levels than required by the Stage 1 Rule. Standards for total trihalomethanes and haloacetic acids under the Stage 2 Rule have not yet been determined. Promulgation of the Stage 2 Rule is pending additional research studies regarding health risk, economic concerns, and other factors.

California is currently in the process of establishing state regulations consistent with the D/DBP Rule and may provide an extension of the implementation date.

TABLE II-1
MAXIMUM CONTAMINANT LEVELS FOR DISINFECTION BY-PRODUCTS

Disinfection By-product	Maximum Contaminant Level (mg/L)
Total trihalomethanes[a]	0.080
Haloacetic acids[b]	0.060
Chlorite	1.0
Bromate	0.010

[a] Total trihalomethanes is the sum of the concentrations of chloroform, bromodichloromethane, dibromochloromethane, and bromoform.
[b] Haloacetic acids is the sum of the concentrations of mono-, di-, and tri-chloroacetic acids and mono- and di-bromoacetic acids.

SOURCE: USEPA, 1998

D. PUBLIC OUTREACH PROGRAM

The SFPUC will conduct a formal public outreach program as part of the Hetch Hetchy Water Treatment Project--Chloramine Conversion to notify, inform, and help prepare the 2.4 million customers in the SFPUC service area. The formal public outreach program will occur primarily in 2002, the year prior to actual conversion to use of chloramine. The public outreach program will target kidney dialysis facilities, as required by the California Department of Health Services, as well as "sensitive" users that can be affected by chloraminated water, such as private and commercial owners of aquariums and fishponds. The SFPUC will also contact the major media to facilitate outreach to the general public.

The outreach program will inform the public of the indirect effects of chloramine conversion and help them prepare for the change in water quality. Most critically, the change in residual disinfectant would result in potentially negative effects to kidney dialysis facilities. The California Department of Health Services requires that all kidney dialysis facilities be upgraded to include chloramine removal equipment and be inspected and certified by the California Department of Licensing and Certification prior to systemwide conversion to chloramine, but not more than one year before conversion begins.

In addition, the SFPUC public outreach program will address other indirect effects of chloramine conversion that would affect various members of the public in different ways and will provide information on ways to safeguard against potential problems. For example, chloramine is known to cause deterioration of certain types of rubber, including the types commonly used for household plumbing seals in hot water tank hoses and toilet flap valves. Once deterioration occurs, these plumbing seals would require replacement by a different of type of rubber. Aquarium and fishpond owners would need to institute pretreatment measures to remove

chloramine as part of their operational practices due to the toxic effects of chloramine on aquatic life. Other businesses and industries, such as those that currently remove chlorine from their process water, may also be affected and could require additional treatment to remove chloramine. The general public may perceive slight changes in taste and odor, associated mainly with a reduction in the taste and odor associated with chlorine. The SFPUC is developing the formal public outreach program for chloramine conversion concurrently with the environmental review process.

One main component of the SFPUC's outreach program is geared toward assisting the BAWUA agencies to plan and prepare for the conversion. The SFPUC participates regularly in the BAWUA water quality committee meetings and is conducting a series of workshops on chloramine conversion for the member agencies. The BAWUA agencies' outreach program will be expanded as the conversion date approaches. However, it is expected that BAWUA agencies will share in the public outreach and notification to water customers in their respective service areas.

- In addition, as part of the CEQA environmental review process and prior to the formal public outreach program, the San Francisco Planning Department conducted a series of public hearings on the Draft EIR that solicited comments from the public and agencies on the environmental document. Public hearings were conducted in San Francisco, on the Peninsula, and in the Pleasanton area.

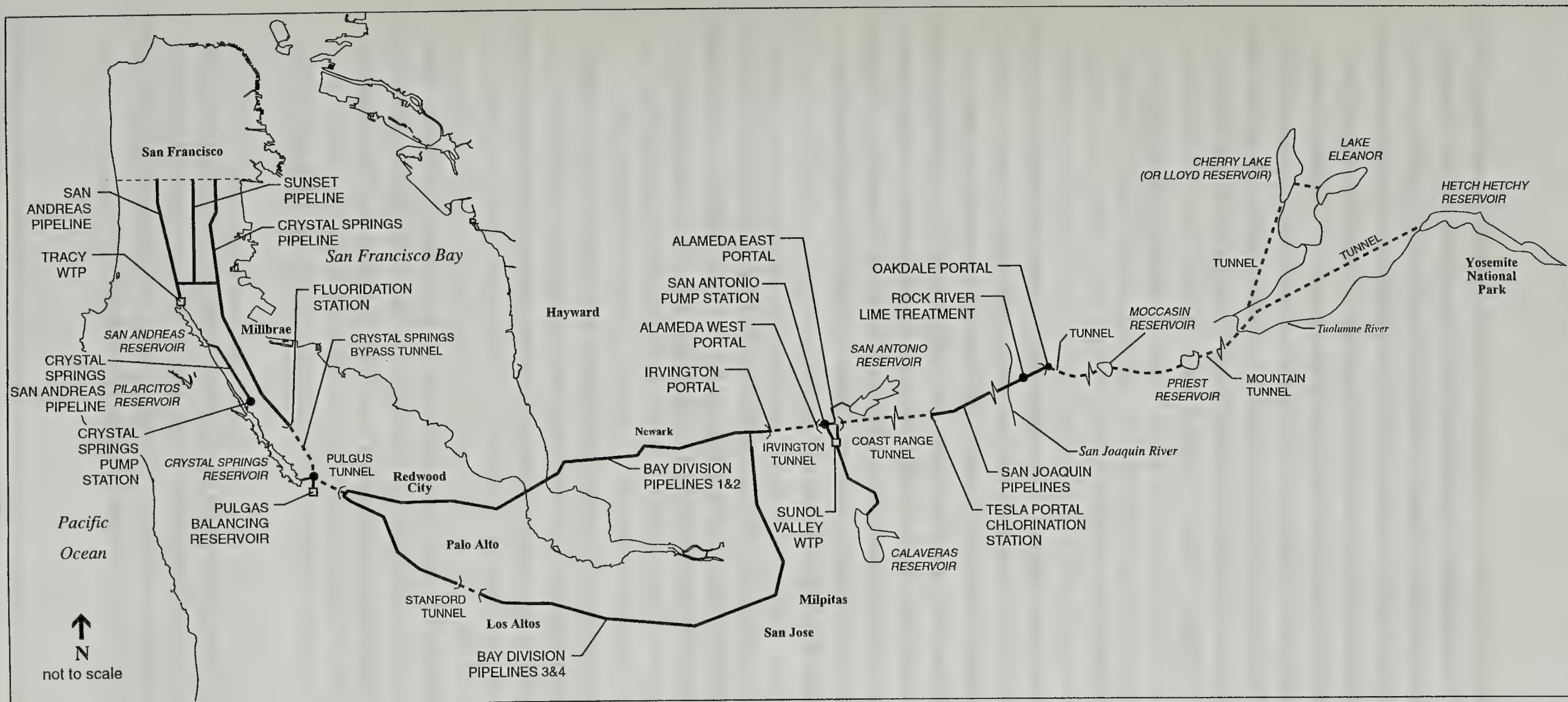
E. SFPUC WATER SUPPLY SYSTEM AND SERVICE AREA

The SFPUC water system currently serves about 2.4 million customers in San Francisco and portions of San Mateo, Santa Clara, and Alameda Counties. Approximately 85 percent of the water supply is provided from the Tuolumne River, and 15 percent is from the local Bay Area watersheds. The water supply system was originally constructed in the late 1800s and early 1900s and consists of a complex network of aqueducts, pipelines, tunnels, reservoirs, and water treatment plants that extend about 150 miles from the Sierra Nevada to the Bay Area (City and County of San Francisco, 1994). Figure II-1 presents a schematic map of the overall SFPUC water system.

1.0 SFPUC WATER SUPPLY SYSTEM

1.1 MAJOR FACILITIES AND OPERATIONS

The SFPUC's Hetch Hetchy system in the Sierra Nevada includes reservoirs, water transmission, and hydroelectric facilities. The main reservoir in the Sierra supplying the SFPUC water system is the Hetch Hetchy Reservoir. The Hetch Hetchy water supply is currently not filtered, since the water meets the water quality requirements for unfiltered water under the Surface Water Treatment Rule. However, the water is treated for disinfection and corrosion control purposes. At Rock River near Oakdale in Stanislaus County, lime is added to the water for corrosion control.



SOURCE: Montgomery Watson, 1993; SFPUC, 2000

1998.898E: Hetch Hetchy Water Treatment Project-Chloramine Conversion / 990095

Figure II-1
SFPUC Water Supply System Map

The Hetch Hetchy water supply flows west from the Sierra Nevada to the Bay Area through the Hetch Hetchy Aqueduct. Since the system was built in stages, segments of the Hetch Hetchy Aqueduct have different names along the 150-mile route and include tunnels, pipelines, and reservoirs. From the foothills across the San Joaquin Valley, the water is conveyed from east to west for 47 miles through three parallel San Joaquin pipelines to the Tesla Portal, located in San Joaquin County on the eastern side of the Coast Ranges mountains. At the Tesla Portal, chlorine, in the form of liquid sodium hypochlorite, is injected into the water supply to provide primary disinfection required to meet drinking water standards. From the Tesla Portal, the Hetch Hetchy water supply is then conveyed through the Coast Range Tunnel to the Alameda East Portal in the Sunol Valley in Alameda County. From the Alameda East Portal, Hetch Hetchy water is transported across the Sunol Valley in the Hetch Hetchy Aqueduct in three pipelines referred to as the Alameda Creek Siphons, which convey water below grade under Alameda Creek to the Alameda West Portal.

Two reservoirs in Alameda and Santa Clara Counties—San Antonio and Calaveras Reservoirs—collect local runoff from the SFPUC Alameda Watershed. All water from these reservoirs is treated at the Sunol Valley Water Treatment Plant (WTP). Treatment processes include coagulation, sedimentation, filtration, corrosion control, and disinfection. The treated water from the Sunol Valley WTP is blended with Hetch Hetchy water within the pipelines crossing under Alameda Creek to the Alameda West Portal. At the Alameda West Portal, about 85 to 90 percent of the water supply is from the Hetch Hetchy system (unfiltered, disinfected) and about 10 to 15 percent is from the Alameda Watershed (filtered, disinfected).

From the Alameda West Portal, blended water from the Hetch Hetchy and Alameda Watershed systems is conveyed in the Hetch Hetchy Aqueduct through the Irvington Tunnel to the Irvington Portal where the water is divided between four Bay Division Pipelines. The Bay Division Pipelines start in the East Bay near Fremont and carry SFPUC water to the South Bay, the Peninsula, and the City. Bay Division Pipelines No. 1 and No. 2 cross San Francisco Bay between Newark and East Palo Alto, and Bay Division Pipelines No. 3 and No. 4 carry water around the southern end of the Bay through Milpitas, San Jose, Sunnyvale, and Palo Alto. SFPUC water is distributed directly to East and South Bay water customers from turnouts along the Bay Division Pipelines.

The four Bay Division Pipelines rejoin near Redwood City at the entrance to the Pulgas Tunnel. The water flows north through the tunnel, and then is transferred either to the Pulgas Balancing Reservoir, Crystal Springs Bypass Tunnel, or Upper Crystal Springs Reservoir. The Pulgas Balancing Reservoir (sometimes called the Crystal Springs Balancing Reservoir) is used to regulate the daily cycle of flows either to the Crystal Springs Bypass Tunnel or Upper Crystal Springs Reservoir.

The Crystal Springs Bypass Tunnel carries water north along the east side of the Peninsula, and this water is distributed directly to customers at lower elevations along the Peninsula and to the City's potable water storage reservoirs and tanks. Fluoride is added to the water along the Bypass Tunnel, so that water customers north of this tunnel receive fluoridated water.

The Upper Crystal Springs Reservoir is part of the SFPUC Peninsula Watershed system. About 15 percent of the total annual SFPUC water supply is discharged to Upper Crystal Springs Reservoir in San Mateo County and stored to meet seasonal supply requirements. This reservoir provides storage for a blend of Hetch Hetchy, Alameda Watershed, and local Peninsula Watershed waters. Water from the Lower Crystal Springs Reservoir is transferred to the San Andreas Reservoir and is pumped to and treated at the Harry W. Tracy Water Treatment Plant (WTP) in San Bruno. Water at the Harry W. Tracy WTP is filtered, disinfected, and injected with fluoride before it is distributed to customers along the Peninsula and to portions of the SFPUC's City Distribution Division system potable water storage reservoirs at higher elevations.

1.2 DISINFECTION

Currently, the SFPUC water supply system is disinfected by free chlorine applied in the form of sodium hypochlorite. Free chlorine is used for both the primary and residual disinfectant. The process of adding free chlorine to the water is called chlorination. Primary disinfection provides initial inactivation of microbial pathogens before the water supply enters the distribution system, and residual disinfection limits any microbial regrowth or development of biofilms in the transmission and distribution facilities. Water quality regulations require a specified combination of minimum concentration of primary disinfectant and length of contact time. Primary disinfection for the SFPUC water supply system occurs at Tesla Portal for Hetch Hetchy waters, at the Sunol Valley WTP for Alameda Watershed waters, and at the Harry W. Tracy WTP for Peninsula Watershed waters. As the chlorinated water flows through the system and is stored in distribution reservoirs, the concentration of chlorine gradually decreases due to volatilization and chemical reactions that occur with the free chlorine. Therefore, additional free chlorine is injected as a residual disinfectant downstream in the water system. Typically, free chlorine is injected at some distribution reservoirs to maintain adequate levels of residual disinfection until the water reaches the consumer.

Chlorination for both primary and residual disinfection currently meets water quality requirements for pathogen inactivation and prevention of waterborne disease. However, use of free chlorine for both primary and residual disinfection results in the potential to form low levels of halogenated compounds, known as disinfection by-products, some of which are suspected carcinogens. Existing chlorine disinfection practices in the SFPUC system result in the formation of disinfection by-products, and depending on the quality of the water and the concentration of free chlorine used, the levels of disinfection by-products may not consistently or reliably meet the requirements of the Stage 1 D/DBP Rule and anticipated future water quality regulations.

2.0 SFPUC SERVICE AREA

The SFPUC service area includes retail customers within the City and County of San Francisco, wholesale customers mainly in the Peninsula, South Bay, and East Bay areas, and other retail customers including the Town of Sunol and Lawrence Livermore National Laboratory. The first group of customers is serviced by the City Distribution Division of the SFPUC, and the second group is serviced by the BAWUA agencies.

The City Distribution Division of the SFPUC is responsible for providing water service to the general public and other retail customers within the City and County of San Francisco. The City Distribution Division manages and operates the network of potable storage tanks, reservoirs, pumping stations, and pipelines used to distribute drinking water throughout the City. At some of the City's multiple potable water storage tanks and reservoirs, the water is chlorinated again to maintain a residual disinfectant prior to distribution to water customers in the City.

The SFPUC also provides water on a wholesale basis to about 30 other water districts and water agencies in the Bay Area, collectively known as the BAWUA agencies. Before distributing water to the general public and retail customers within their individual service areas, the BAWUA member agencies provide any additional storage, treatment, and conveyance facilities that may be needed. Many of the BAWUA agencies (approximately 14) receive SFPUC water as their only water supply. Others receive chloraminated water from other water agencies such as the Santa Clara Valley Water District, or have groundwater supplies (either chlorinated or unchlorinated) to augment SFPUC water. The locations of the BAWUA member agencies are shown in Figure II-2, and a list of BAWUA member agencies is provided in Table II-2.

REFERENCES – Introduction and Background

Camp Dresser & McKee, *Hetch Hetchy Treatability Study*, 1995.

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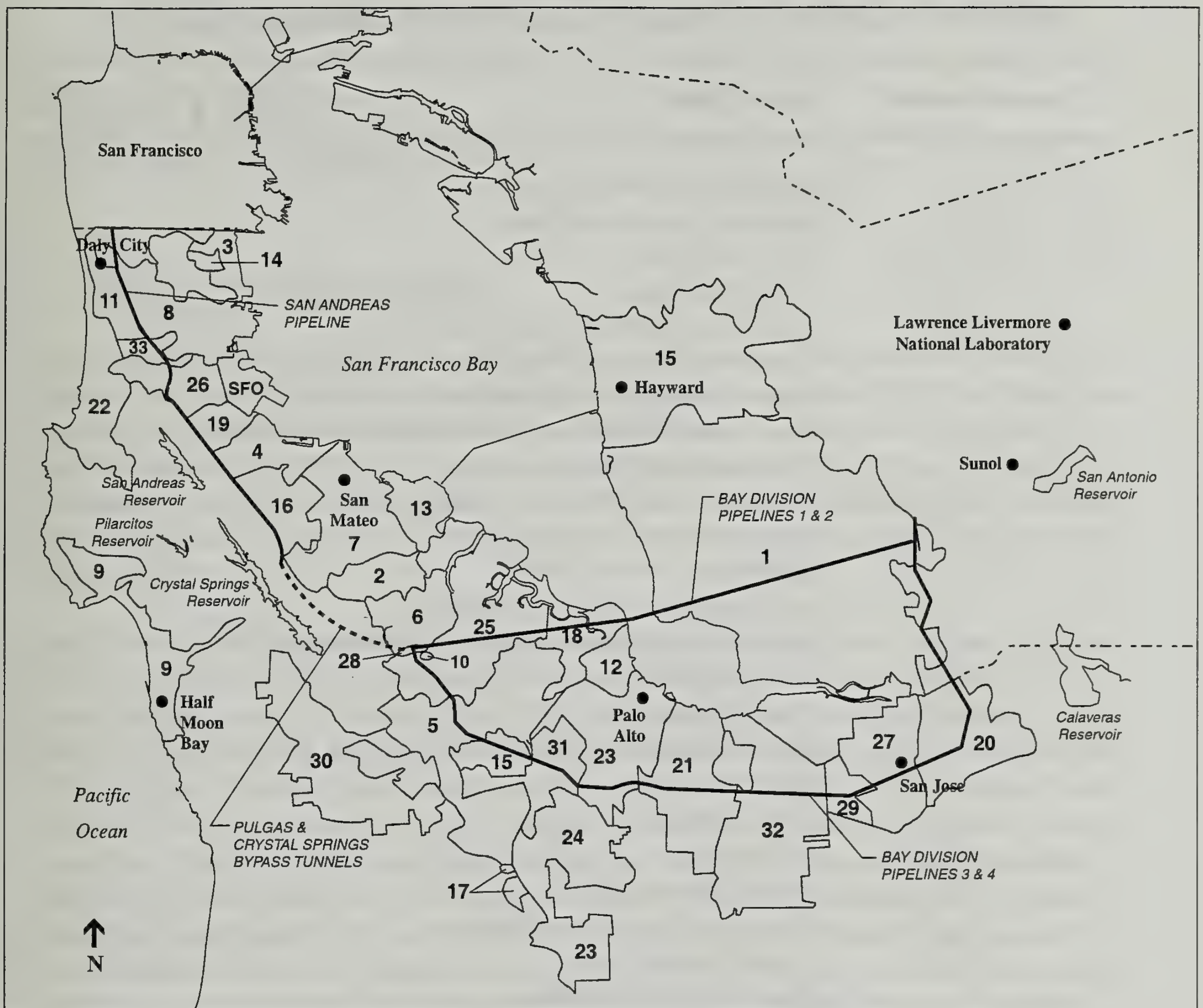
San Francisco Water Team, prepared for the San Francisco Public Utilities Commission, *Hetch Hetchy Water Treatment Project Chloramine Conceptual Design Report*, Final Draft, 1999.



NOTE: See Table II-2 for corresponding names of member agencies

SOURCE: SFPUC, 1999

1998.898E: Hetch Hetchy Water Treatment Project-Chloramine Conversion / 990095

Figure II-2
Location of BAWUA
Member Agencies

TABLE II-2
MEMBER AGENCIES OF THE BAY AREA WATER USERS ASSOCIATION

Location Number[a]	Agency Name
1	Alameda County Water District
2	Belmont County Water District
3	City of Brisbane
4	City of Burlingame
5	Bear Gulch – Cal Water Service Company
6	City of San Carlos – Cal Water Service Company
7	City of San Mateo – Cal Water Service Company
8	City of South San Francisco – Cal Water Service Company
9	Coastside County Water District
10	Cordilleras Mutual Water Association
11	City of Daly City
12	East Palo Alto Water District
13	Estero Municipal Improvement District
14	Guadalupe Valley Municipal Improvement District
15	City of Hayward
16	Town of Hillsborough
17	Los Trancos County Water District
18	City of Menlo Park
19	City of Millbrae
20	City of Milpitas
21	City of Mountain View
22	North Coast County Water District
23	City of Palo Alto
24	Purissima Hills Water District
25	City of Redwood City
26	City of San Bruno
27	City of San Jose
28	Palomar County Water District #3 – Cal Water Service Company
29	City of Santa Clara
30	Skyline County Water District
31	Stanford University
32	City of Sunnyvale
33	Westborough Water District

[a] See Figure II-2 for a corresponding map that shows location numbers.

SOURCE: SFPUC, 1999

CHAPTER III

PROJECT DESCRIPTION

A. PROJECT OBJECTIVES

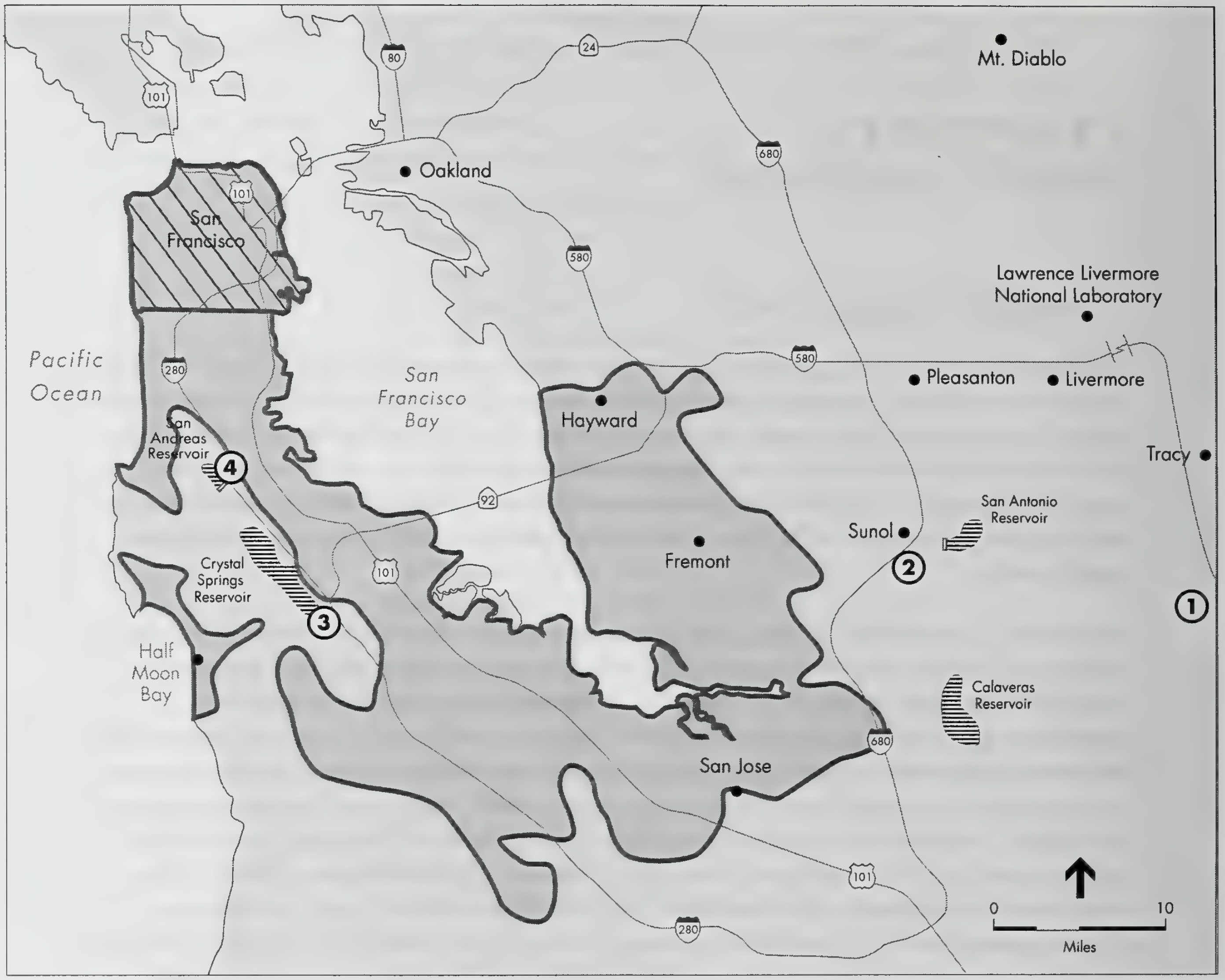
The overall purpose of the Hetch Hetchy Water Treatment Project--Chloramine Conversion is to improve the reliability of the San Francisco Public Utilities Commission (SFPUC) drinking water supply system to meet water quality requirements of the Stage 1 Disinfectants and Disinfection By-Products Rule (D/DBP Rule), which became effective in 1999. The proposed project is designed to comply with these regulations in a cost-effective, environmentally sensitive manner, with the minimum number of facilities needed to be compatible with the existing overall water supply system.

In addition, an ancillary project objective is to comply with the State Water Code that prohibits discharge of chlorine or other substances that are toxic to aquatic organisms into reservoirs, creeks, or other waters of the state. The SFPUC is currently in the process of constructing facilities at various locations to remove chlorine from the drinking water supply prior to discharge to surface water bodies in order to meet these discharge requirements. Since chloramine is more persistent than chlorine and may pose prolonged toxic conditions to aquatic organisms compared to chlorine, it would be even more important after the conversion to chloramine to remove the chlorine portion of chloramine from the water at all sites where chloraminated SFPUC system water may be discharged to the environment. In addition, due to water quality conditions at Crystal Springs Reservoir, it would be necessary to remove all or some of the ammonia portion of chloramine prior to discharge to the reservoir to prevent negative impacts on water quality in Crystal Springs Reservoir. Therefore, the purpose of some of the proposed facilities is to protect the environment from chlorinated and chloraminated water discharges, in addition to improving water quality and improving reliability to meet drinking water quality regulations.

B. PROJECT LOCATION

The proposed project would require construction of new facilities at four main locations along the SFPUC water supply system, as shown in Figure III-1. All sites proposed for the SFPUC improvements are located on lands owned by the City and County of San Francisco; by necessity, proposed facilities at these sites are adjacent or in proximity to existing facilities related to the water system. The major facility locations are listed below:

- Tesla Portal site, located off of Vernalis Road in San Joaquin County, south of Tracy
- San Antonio Pump Station site, located on Calaveras Road in the Sunol Valley in Alameda County



FACILITY LOCATIONS

1. Tesla Portal Site
2. San Antonio Pump Station Site and Alameda East and West Shafts Sites
3. Pulgas Site and Pulgas Balancing Reservoir Site
4. Harry W. Tracy Water Treatment Plant Site

City and County of San Francisco City Distribution Division (CDD)

Bay Area Water Users Association (BAWUA) Member Agencies Aggregate Service Area

SOURCE: Yuki A. Kawaguchi, Cartographer; ESA+Orion. 2000

Figure III-1
Project Location

- Pulgas site, located near the Pulgas Water Temple on Cañada Road near Woodside in San Mateo County
- Harry W. Tracy Water Treatment Plant (WTP) site, located on Crystal Springs Road in San Bruno in San Mateo County

In addition, the conversion to chloramine may require physical and/or operational modifications to the water distribution systems and related facilities throughout the SFPUC service area. The location of the SFPUC service area is shown in Figure III-1. The SFPUC service area encompasses the City and County of San Francisco (served by the City Distribution Division of the SFPUC) as well as portions of the Peninsula and East and South Bay areas (served by the Bay Area Water Users Association [BAWUA] member agencies).

C. DEVELOPMENT OF PROPOSED PROJECT

The purpose of the Hetch Hetchy Water Treatment Project is to plan, design, and construct the necessary treatment facilities so that the SFPUC water supply can reliably meet existing and anticipated state and federal drinking water regulations (see Section II.C, Regulatory Framework). The SFPUC initially conducted water quality treatability studies to evaluate alternative disinfection methods (see Section VII.C, Disinfection Alternatives) and concluded that the residual disinfectant should be converted from chlorine to chloramine in order to lower levels of disinfection by-products to reliably meet regulatory requirements for drinking water. In August 1996, the SFPUC completed Phase 1A, Preliminary Engineering, of the Hetch Hetchy Water Treatment Project, which examined treatment needs associated with chloramination in addition to improvements associated with corrosion control, ozonation without filtration, emergency filtration, and treated water storage for the Sunol Valley WTP (San Francisco Water Team, 1996). This engineering report recommended that the SFPUC proceed immediately with systemwide chloramination as well as various improvements to the Sunol Valley WTP. Other recommendations included postponement of ozonation or continuous filtration facilities based on future policy or regulatory considerations. Phase 1A also included evaluation of various alternatives for implementing chloramination.

In March 1999, the SFPUC completed Phase 1B, Conceptual Engineering, which presented the conceptual design for chloramine-related facilities (San Francisco Water Team, 1999a). This report provided results of water quality studies, evaluation of environmental and aquatic discharge issues, preliminary facility requirements for the chloramine conversion process, review of operational issues, and estimated project cost and implementation recommendations. This report serves as the basis for the project description and analysis presented in this environmental impact report (EIR).

D. PROPOSED TREATMENT PROCESSES

The SFPUC water supply system currently uses chlorination for both primary and residual disinfection. Chlorination is the process of adding free chlorine to the water system to inactivate bacteria, viruses, and pathogens. The SFPUC uses free chlorine in the form of liquid sodium

hypochlorite as the initial or primary disinfectant, then injects additional sodium hypochlorite at various points in the transmission and distribution system to maintain lower levels of residual chlorine in the water to prevent regrowth of bacteria or pathogens. The proposed project would convert this disinfection system to a sequential disinfection strategy, where chlorine would be maintained as the primary disinfectant and would be followed by chloramine as the residual disinfectant.

The process of adding chloramine to water for disinfection is called chloramination. Chloramine is a combination of chlorine and ammonia. Similar to free chlorine, it acts as a disinfectant, but it is a more stable compound than chlorine, persists longer in the distribution system, and forms very low levels of disinfection by-products. However, chlorine is a much stronger biocide than chloramine and would still be required for primary disinfection. The proposed sequential disinfection method was determined to provide the most reliable disinfection of the SFPUC water system to achieve compliance with existing and proposed water quality regulations (San Francisco Water Team, 1996).

The proposed project would involve injecting and removing chemicals at various points along the SFPUC water supply system to meet the project objectives. The existing and proposed treatment processes involving chemical addition and removal are described below. Section III.E, below, describes the facilities needed to implement these process changes.

1.0 ADDITION OF CHLORINE AND AMMONIA

The proposed project would not change the SFPUC's existing treatment processes or facilities between the system's starting point in the Sierra Nevada and the Tesla Portal on the west side of the San Joaquin Valley. All proposed changes would occur from the Tesla Portal downstream toward the Bay Area. At the Tesla Portal, the proposed project would involve only structural changes, replacing and upgrading the existing primary disinfection storage and chemical feed facilities. There would be no change to the chemical treatment process, since chlorine as sodium hypochlorite would continue to be injected into the water supply to meet the primary disinfection requirements.

As the water flows west toward Alameda County, the first proposed change in the chemical treatment process would occur at a proposed new facility at the San Antonio Pump Station in the Sunol Valley area in Alameda County. At this proposed facility, ammonia would be injected into the water supply that had been chlorinated at the Tesla Portal. The ammonia would combine with chlorine already in the water to form chloramine, which would act as a residual disinfectant in the water supply. At the new facility, additional chlorine would be added as needed to compensate for chlorine losses throughout the system and to maintain required levels of residual chloramine for continued disinfection in the distribution system. The preliminary design indicates that chlorine and ammonia should be maintained in the water supply system at a ratio of about five parts chlorine to one part ammonia in order to meet water quality requirements. In addition, the new facilities at either the San Antonio Pump Station or Tesla Portal would include chemical storage and metering pumps for adding a caustic chemical, sodium hydroxide, to the water system for corrosion control.

As the water continues to flow west to the Bay Area, most of the disinfected water is conveyed directly from the SFPUC pipelines to various distribution systems in the SFPUC service area. About 15 percent of the total annual SFPUC water supply is discharged to the Crystal Springs Reservoir for temporary storage. This water is then conveyed to and treated at the Harry W. Tracy WTP. At Harry W. Tracy WTP, ozonation is currently used for primary disinfection and chlorination is used for the residual disinfectant and as a back-up disinfection system to ozone. The proposed project would modify the treatment processes at the Harry W. Tracy WTP by augmenting the existing chlorine injection facilities and adding ammonia injection facilities. The proposed new chemical facilities would inject chlorine and ammonia into the water supply to form chloramine as the residual disinfectant prior to distribution to water customers along the Peninsula and in San Francisco.

The proposed sequential disinfection process would meet the federal disinfection requirements of the Total Coliform, Enhanced Surface Water Treatment, and Stage 1 D/DBP rules, thereby providing a higher level of public health protection than the existing disinfection system.

2.0 REMOVAL OF CHLORINE AND AMMONIA

The SFPUC water supply system includes a number of locations where disinfected drinking water is either intentionally discharged or incidentally overflows into local surface water bodies; these are referred to in this EIR as secondary discharge locations. While disinfection of the drinking water supply is necessary to protect public health, discharge of chlorinated or chloraminated water can result in adverse effects to surface water bodies and to aquatic organisms. Therefore, the proposed project includes facilities that would remove chlorine and/or ammonia at various locations along the system in order to protect water quality of local surface water bodies.

The process of removing chlorine from water is called dechlorination. Dechlorination typically involves adding chemicals such as sodium bisulfite, sodium thiosulfate, or citric acid, which react with the chlorine in the water to form chloride, an inert, nontoxic substance. Thus, the dechlorinated discharge water contains a slight increase in chloride levels but no chlorine, and it is protective of aquatic resources.

The process of removing both chlorine and ammonia from water is called dechloramination. Dechloramination is a two-step process that involves first lowering the ammonia levels and then removing the chlorine. The first step of lowering the ammonia level involves adding an acidic compound (e.g., sulfuric acid, hydrochloric acid, or carbon dioxide) to the water to lower the pH, which is needed for chemical efficiency in the ammonia removal process. Then supplemental doses of chlorine in the form of sodium hypochlorite are added to the water in the ratio of about ten parts chlorine to one part ammonia to oxidize the ammonia portion of the chloramine. This step requires 30 to 60 minutes of contact time and results in the conversion of ammonia to nitrogen gas, which is released as a harmless gas to the atmosphere. The second step of dechloramination is to remove the chlorine. This process, as described above under dechlorination, involves addition of a dechlorinating chemical, typically sodium bisulfite, to convert the chlorine to chloride. The resultant discharge water following dechloramination has reduced levels of ammonia and no chlorine.

The California Regional Water Quality Control Board (RWQCB) prohibits the discharge of both chlorinated and chloraminated water to surface waters due to the widespread toxicity of chlorine to a number of aquatic organisms. Chlorine, present in both chlorinated and chloraminated waters, is potentially toxic to aquatic life, and the RWQCB requires that all residual chlorine be removed from chlorinated and chloraminated drinking water before the water is acceptable for discharge to surface waters of the state.

To protect local surface waters, the proposed project would construct permanent dechlorination facilities at secondary discharge locations along the system downstream of the proposed changes to the SFPUC water system. At these overflow points, disinfected water could or would be discharged to local surface waters such as those at the Alameda East and Alameda West Portals in the Sunol Valley, where overflow water can enter Alameda Creek, or Harry W. Tracy WTP where overflows can be discharged to San Andreas Reservoir.

At these locations, after the chlorine is removed, ammonia would still be present in the discharge water. Under certain conditions, ammonia can also be toxic to aquatic life; for this reason, the RWQCB has established limits for discharge of ammonia to receiving waters. The concentration of the toxic form of ammonia is dependent upon the pH and temperature range of the receiving water (see Section IV.D, Hydrology and Water Quality). For the Bay Area in general, the concentration of ammonia in chloraminated water would not be in the toxic range at the pH and temperature of the receiving water body. Therefore, discharge of the projected levels of ammonia to surface waters would be in compliance with RWQCB objectives for ammonia toxicity.

However, for some surface water bodies, discharge of even low levels of ammonia may result in water quality impacts associated with biostimulation. For example, if ammoniated water is discharged to water bodies where nitrogen is in short supply (referred to as nitrogen-limited), the addition of nitrogen present in ammonia can contribute an essential plant nutrient and stimulate algae growth and cause eutrophication.[1] In general, incidental overflows associated with secondary discharges occur in low volumes and frequencies such that biostimulatory effects of ammonia are not likely.

At Crystal Springs Reservoir, there are regular discharges of disinfected drinking water where ammonia may result in water quality effects. Preliminary studies have indicated that the water quality of Crystal Springs Reservoir may be sensitive to elevated nitrogen levels. Currently, water quality studies are underway as part of the proposed project to determine to what extent Crystal Springs Reservoir is nitrogen-limited and how it would be affected by discharge of ammonia at levels projected to be in the chloraminated water. Results of the water quality studies would be used during the design phase of the proposed project to determine the level of ammonia removal necessary to avoid biostimulatory effects. The studies would also aid in identifying the most effective methods for protecting water quality in Crystal Springs Reservoir from biostimulation. Therefore, this EIR analyzes the most conservative scenario which assumes maximum removal of ammonia (for maximum water quality protection) combined with

1 Eutrophication is the process that occurs when a natural body of water receives high concentrations of dissolved nutrients, which can promote excessive growth of algae and lead to oxygen depletion and poor water quality conditions.

maximum construction disruption. The proposed project described and analyzed in this EIR includes full-scale facilities for dechloramination of water prior to discharge to Crystal Springs Reservoir, though actual facility requirements may be less (i.e., smaller structure). The resulting water discharged to Crystal Springs Reservoir would have all of the chlorine removed and the appropriate level of ammonia removed to prevent biostimulation.

E. PROPOSED FACILITIES – PROJECT-LEVEL ANALYSIS

The Hetch Hetchy Water Treatment Project--Chloramine Conversion would require construction of new facilities at four main project locations along the SFPUC water supply system—Tesla Portal, Sunol Valley, Pulgas Water Temple, and Harry W. Tracy WTP—as shown in Figure III-1, above. Table III-1 summarizes the facilities required at each site. Physical environmental effects associated with construction and operation of the facilities described in this section are analyzed in Chapter IV of this EIR at a *project level*, which means that detailed, site-specific analysis of potential effects is provided for each of the facilities. New facilities or modifications to existing facilities are described below, from east to west, following the direction of the water flow.

1.0 TESLA PORTAL CHLORINATION FACILITY

The Tesla Portal facility is located off of Vernalis Road in San Joaquin County, seven miles south of Tracy. This facility is situated at a juncture where the San Joaquin Pipelines end (on the eastern side of the Coast Ranges mountains) and where the Coast Range Tunnel begins, as shown in Figures III-2 and III-3. The facilities at this site were originally constructed in 1936 and include an overflow structure / surge shaft, chlorination building, and pump house, as well as a SFPUC personnel residence and garage. In 1949 and 1963, two valve houses were added, with various subsequent minor upgrades.

This component of the proposed project consists of a new chlorine storage and feed facility, proposed for construction at a vacant site near the existing chlorine feed system, about 100 feet east of the residence, as shown in Figure III-4. This facility would replace the chlorine feed facility, which would be abandoned. The new facility would have upgraded seismic and chemical storage and handling design features, and it would accommodate increased chlorine storage as well as chemical metering pumps and related equipment. The new facility would not change current treatment processes at the Tesla Portal facility and would maintain the level of chlorine added to the water supply as the primary disinfectant.

About 300 linear feet of 6-inch-diameter, buried, double-contained pipe[2] would be installed to convey the liquid chlorine from the new chemical building to the water supply pipeline at the entry to the Coast Range Tunnel. A new loop road, about 1,200 feet long and 20 feet wide, would replace the existing road to improve access for chemical delivery trucks. The site would

[2] Double-contained piping is a precautionary containment system used for chemical pipelines where a smaller diameter pipe is housed within a larger diameter pipe to protect the environment from pipeline leaks or spills.

TABLE III-1
SUMMARY OF CHLORAMINE CONVERSION PROJECT COMPONENTS

Location[a]	Project Component	New Structures	New Roadways	New Impervious Surfaces	Pipelines[b]
1. Tesla Portal, San Joaquin County	Replace and upgrade chlorine feed and storage facility; abandon existing structure.	Chemical building: 100 feet wide x 150 feet long x 30 feet high Retaining Wall: 200 feet long x 8 to 12 feet high	Access and loop road: 1,100 linear feet x 20 feet wide Paved parking: 42 feet x 60 feet	15,000 + 22,000 + 2,520 = 39,520 square feet	300 linear feet of 6-inch-diameter, buried, double-contained pipeline (liquid chlorine and sample pipeline)
2a. San Antonio Pump Station, Sunol Valley, Alameda County	Construct new ammonia, chlorine, and caustic feed facilities.	Chemical building: 100 feet wide x 150 feet long x 30 feet high	Access and loop road: 400 feet x 20 feet Paved parking: 40 feet x 30 feet	15,000 + 8,000 + 1,200 = 24,200 square feet	3,200 linear feet of 4- to 6-inch-diameter, buried, double-contained pipeline for each chemical (liquid chlorine, ammonia, and caustic[c])
2b. Alameda East Shaft, Sunol Valley, Alameda County	Construct a dechlorination facility.	Permanent shed: 20-30 feet wide x 30 feet long x 12 feet high	Existing	600 to 900 square feet	200 linear feet of 4- to 6-inch-diameter, buried, double-contained pipeline (sodium thiosulfate)
2b. Alameda West Shaft, Sunol Valley, Alameda County	Construct a dechlorination facility.	Permanent shed: 20-30 feet wide x 30 feet long x 12 feet high	Existing	600 to 900 square feet	200 linear feet of 4- to 6-inch-diameter, buried, double-contained pipeline (sodium thiosulfate)
3a. Pulgas Site, San Mateo County	Construct a dechloramination facility and pipeline.	Chemical building: 100 feet wide x 200 feet long x 30 feet high Buried pipeline contactor or underground basin contactor (65,000 sq. ft.)	Access road: 200 feet x 20 feet Paved area: 100 feet x 50 feet Truck turnaround: 300 feet x 20 feet	20,000 + 4,000 + 5,000 + 6,000 = 35,000 square feet	About 1,000 linear feet of 4- to 6-inch-diameter, buried, double-contained pipeline (liquid and chemical pipeline) 4,600 linear feet of 10- to 12-foot-diameter contactor pipeline

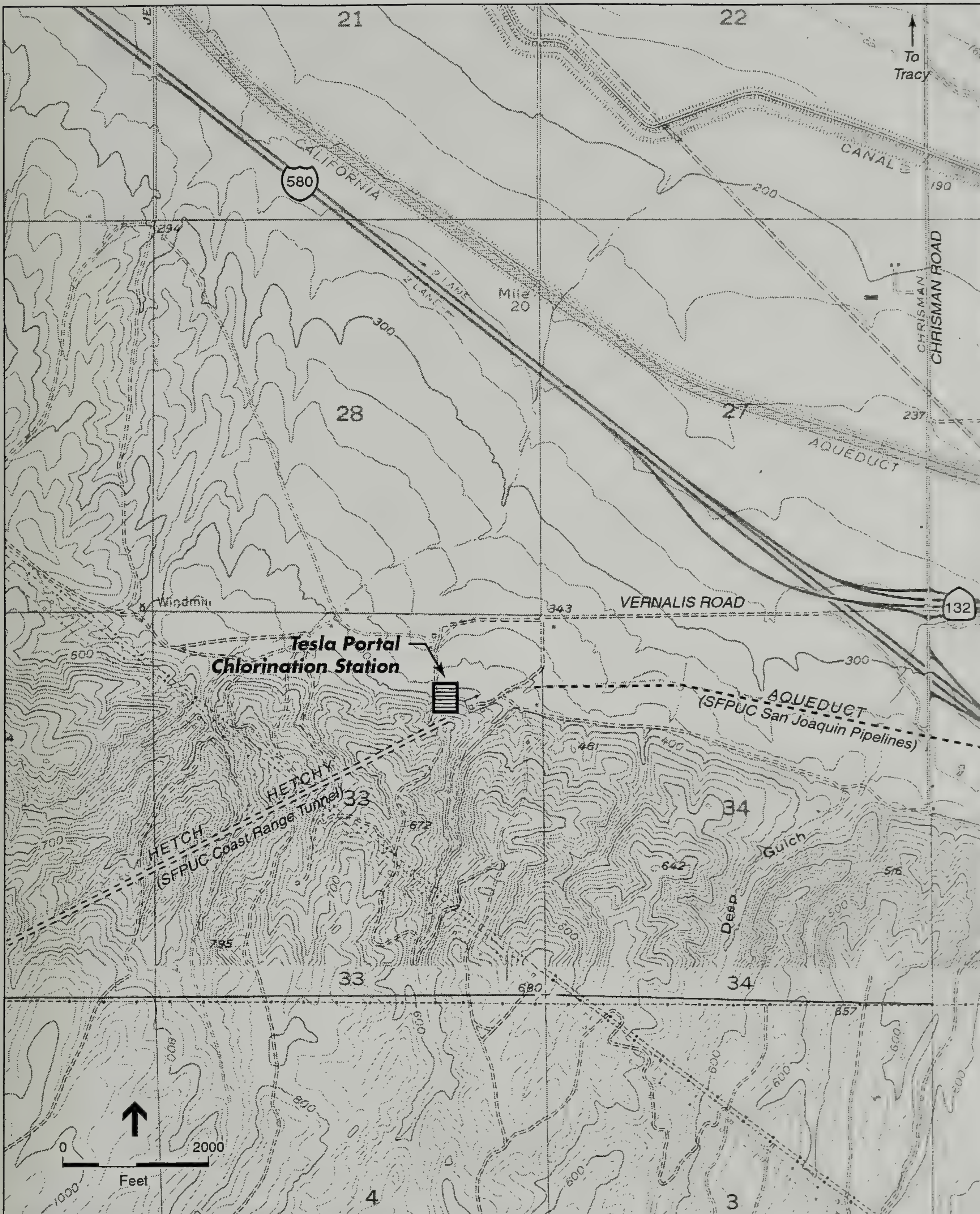
TABLE III-1 (Continued)
SUMMARY OF CHLORAMINE CONVERSION PROJECT COMPONENTS

Location[a]	Project Component	New Structures	New Roadways	New Impervious Surfaces	Pipelines[b]
3b. Pulgas Balancing Reservoir, San Mateo County	Upgrade reservoir and construct chlorine-boosting station.	Internal piping - Inlet/outlet pipe: 84-inch-diameter x 250 feet - Inlet/outlet pipe: 66-inch-diameter x 255 feet - Relocate two flap gates	Existing	None	Internal only
		Chlorine-boosting station located at site 3a, above		Included in site 3a, above	500 linear feet of 6-inch-diameter pipeline
4. Harry W. Tracy WTP, San Mateo County	Construct new ammonia and chlorine feed and storage facilities and permanent dechlorination facility.	Ammonia storage structure: 30 feet wide x 50 feet long x 30 feet high at one of two sites Chlorine storage structure: 40 feet wide x 40 feet long x 30 feet high at one of two sites Dechlorination facility: 10 feet wide x 12 feet long x 10 feet high.	Existing	1,500 + 1,600 + 120 = 3,220 square feet	500-550 linear feet of 2- to 4-inch-diameter, buried, double-contained chemical pipeline for each chemical (ammonia and chlorine) 10 linear feet of 2-inch pipe for the dechlorination chemicals (sodium thiosulfate)
5. Secondary Discharge Locations in Alameda, San Mateo, and San Francisco Counties	Construct dechlorination facilities.	Permanent facilities: 20 feet wide x 30 feet long x 12 feet high Portable facilities: trailer-mounted	Varies	Permanent: 600 square feet Portable: none	Varies
6. CDD Facilities, San Francisco County	Implement various operational modifications to existing reservoirs, pumping stations, or chlorination facilities.	Typically, no new structures; operational modifications to existing structures only	Typically existing	Typically none	Typically existing

TABLE III-1 (Continued)
SUMMARY OF CHLORAMINE CONVERSION PROJECT COMPONENTS

Location[a]	Project Component	New Structures	New Roadways	New Impervious Surfaces	Pipelines[b]
7. BAWUA Members' Facilities in San Mateo, Santa Clara, and Alameda Counties	Implement various modifications to existing reservoirs and distribution systems.	Currently unknown	Typically existing	Unknown	Currently unknown

a See Figure III-1 for project locations.
b Chemical pipelines would be designed to include redundancy in the event of failure. Linear feet of pipe shown on the table indicate length of a single pipeline for each trench and each injection point.
c Caustic could be added at either San Antonio Pump Station or Tesla Portal, but not at both.



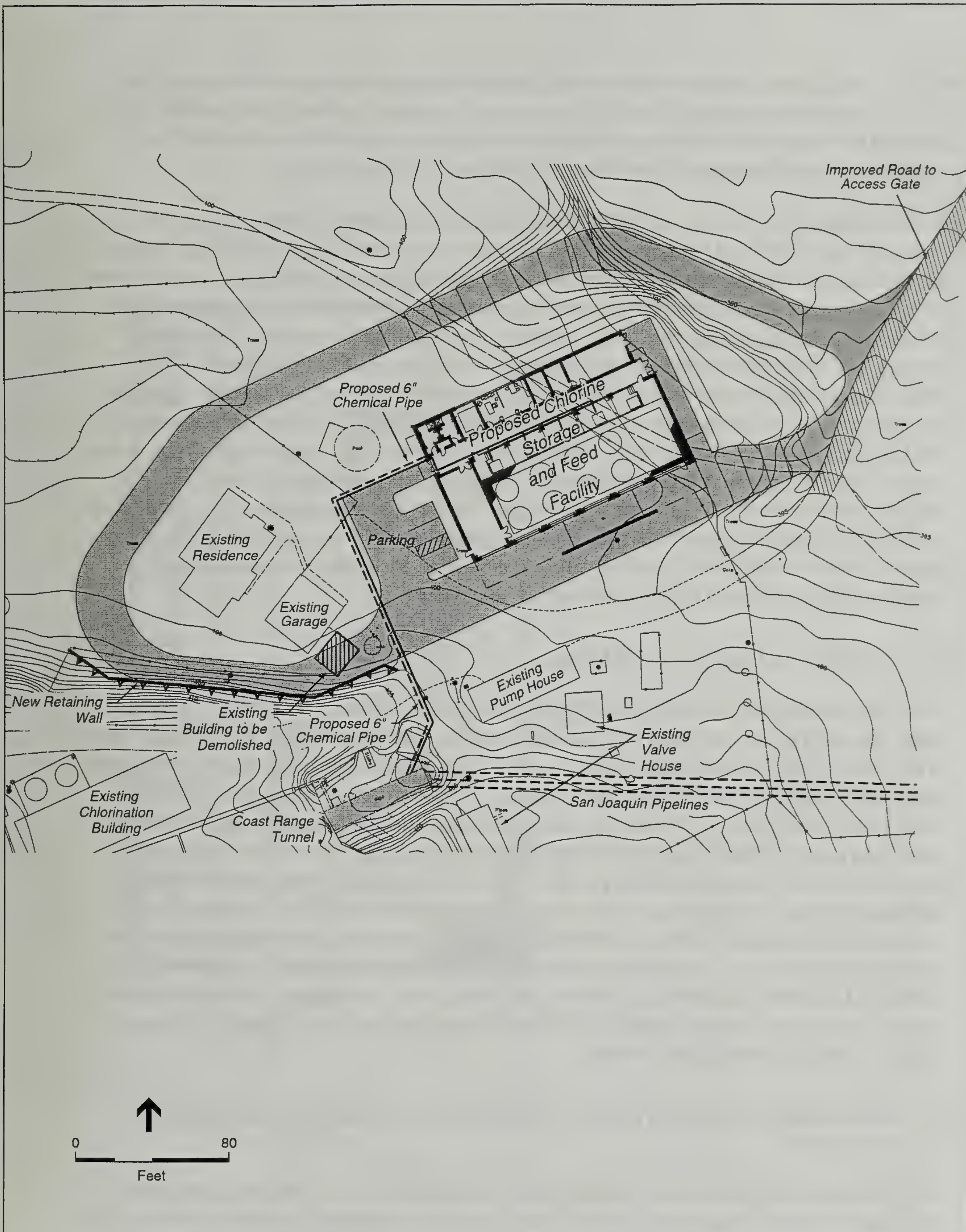
SOURCE: USGS; Yuki A. Kawaguchi, Cartographer;
ESA+Orion, 2000

Figure III-2
Tesla Portal
Vicinity Map, USGS

SOURCE: Towill, Inc., 1999; ESA+Orion, 2000

-1998.898E: Hetch Hetchy Water Treatment Chloramine Conversion Project EIR / 990095

Figure III-3
Tesla Portal
Vicinity Map, Aerial



SOURCE: San Francisco Water Team, 1999

1998.898E: Hetch Hetchy Water Treatment Chloramine Conversion Project EIR / 990095

Figure III-4
Tesla Portal Chlorination Facility
Site Plan

require grading to accommodate the expanded facilities and roadway, and a 200-foot-long and 8- to 12-foot-high retaining wall would be constructed to support a portion of the roadbed. The proposed elevation of the building pad is designed to balance cut-and-fill requirements. One outbuilding next to the garage at the residence is proposed to be demolished.

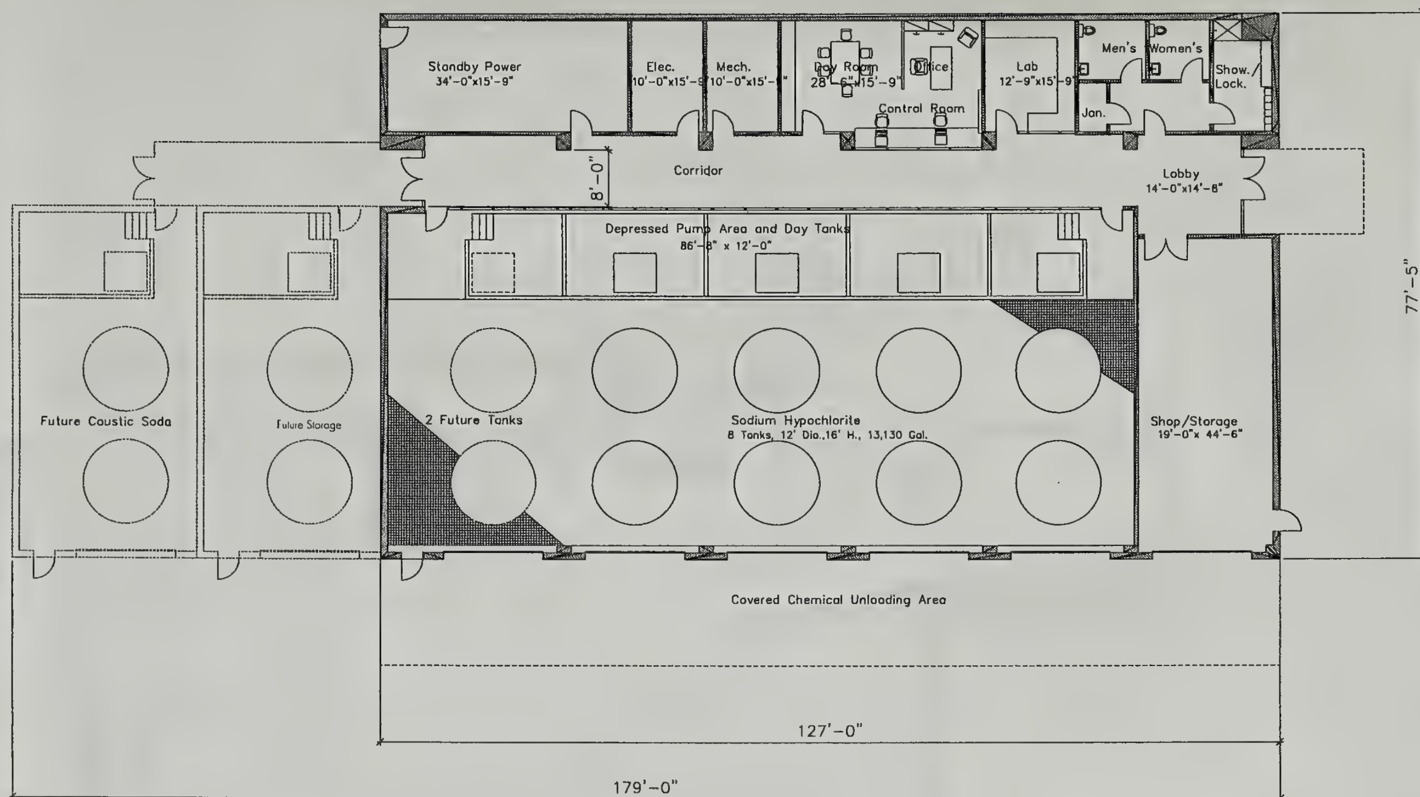
A more detailed floor plan and section of the proposed chlorine storage and feed facility are shown in Figures III-5 and III-6, respectively. The new facility would be about 100 feet wide by 150 feet long and 30 feet high. The structure would be designed to accommodate potential future chemical storage and injection systems, including caustic soda that could be added in the future for corrosion control purposes; the future corrosion control system is currently in conceptual planning and would be located either at Tesla Portal or the San Antonio Pump Station. The proposed structure is divided into two rectangular zones of high and low bay heights. The high bay space would provide clearance for chemical storage and tank-related maintenance, while the low bay space would be used for office, laboratory, and support space. In the high bay space, the chemical would be stored in tanks supported by a concrete slab above a containment area. The feed pumps and tanks would be lower than the main floor level so that chemical feed could occur without a pressure differential. The chemical loading area would be covered and surrounded by berms to protect the area from potential spills. The building orientation and exterior facade would be designed to blend with the surrounding environment.

2.0 SUNOL VALLEY FACILITIES

Three new facilities are proposed in the Sunol Valley in the vicinity of the existing San Antonio Pump Station. The San Antonio Pump Station, located on Calaveras Road about four miles south of the town of Sunol in Alameda County, is used to pump water from the San Antonio Reservoir to the Sunol Valley WTP or to Calaveras Reservoir. It can also be used to pump Hetch Hetchy water to the Sunol Valley WTP or to San Antonio Reservoir or San Antonio Creek. The pump station can pump 160 million gallons per day to San Antonio Reservoir, and with some gravity flow, it can pump 260 million gallons per day to San Antonio Creek. There are dechlorination facilities at the San Antonio Pump Station used to remove chlorine from Hetch Hetchy water in the event that chlorinated water is discharged from the pump station to either San Antonio Creek or San Antonio Reservoir. In addition, dechlorination chemicals are currently stored at this facility and transferred as needed to Alameda East Portal for use in the temporary dechlorination facility. Figures III-7 and III-8 depict SFPUC facilities and features in the Sunol Valley in the vicinity of the San Antonio Pump Station.

2.1 SAN ANTONIO PUMP STATION AMMONIA AND CHLORINE FEED FACILITY

A new ammonia and chlorine feed facility would be constructed at a vacant site adjacent to the San Antonio Pump Station, about 120 feet west of the existing structure, as shown on the site plan in Figure III-9. The new facility would be similar in size to the existing San Antonio Pump Station. It would accommodate ammonia and chlorine storage, as well as chemical metering pumps and related equipment, and would include new pipelines to inject the chemicals into the

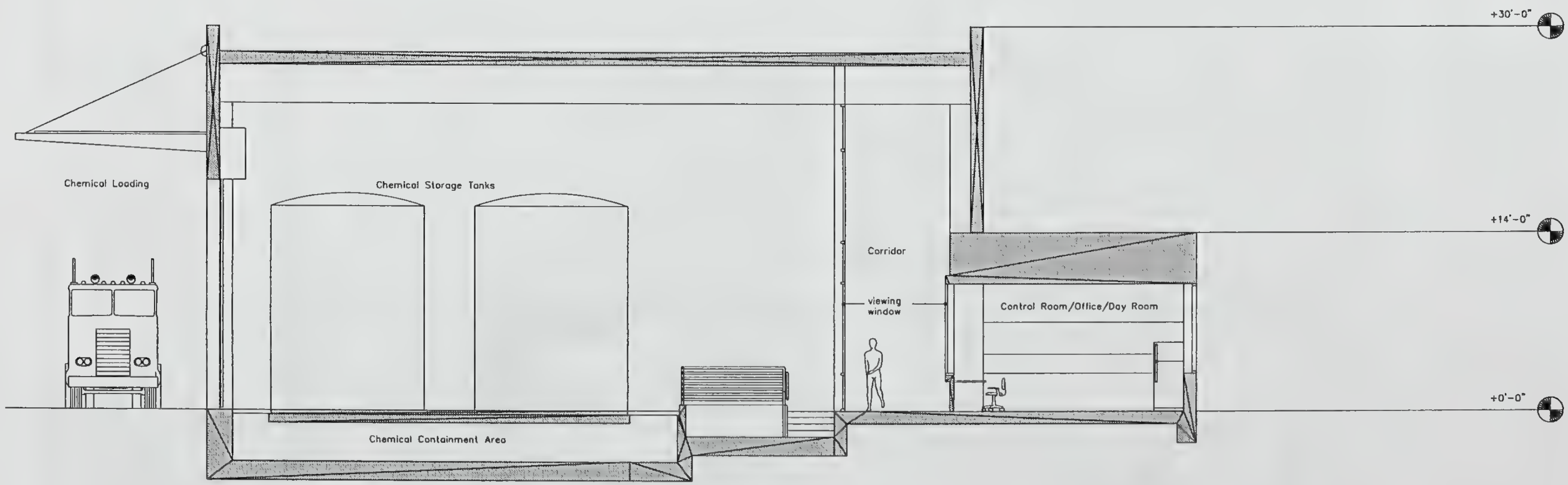


SOURCE: San Francisco Water Team, 1999

1998.898E: Hetch Hetchy Water Treatment Project-Chloramine Conversion / 990095 ■

Figure III-5

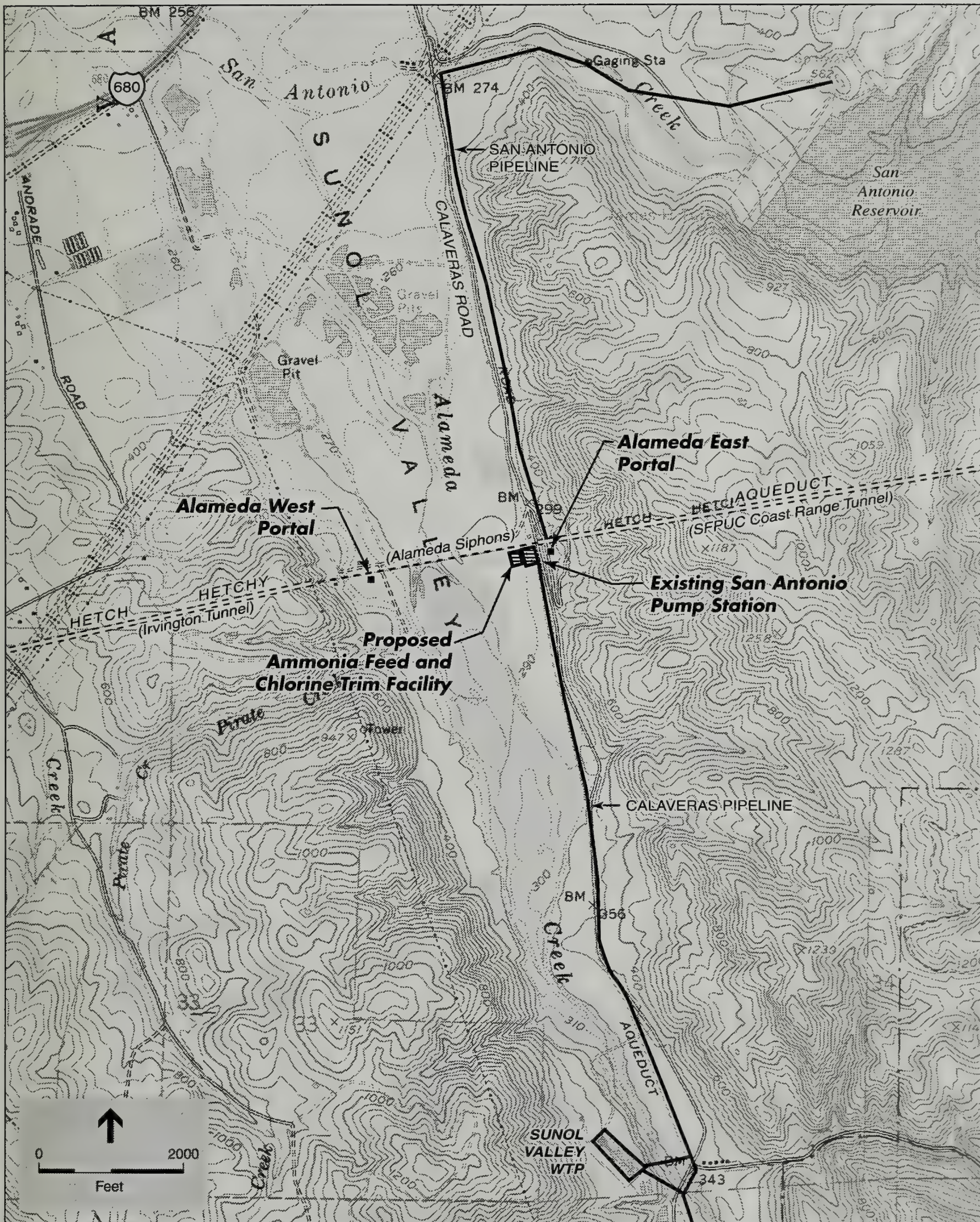
Typical Chlorine Storage and Feed Facility
Layout at Tesla Portal Site



SOURCE: San Francisco Water Team, 1999

1998.898E: Hetch Hetchy Water Treatment Project-Chloramine Conversion / 990095

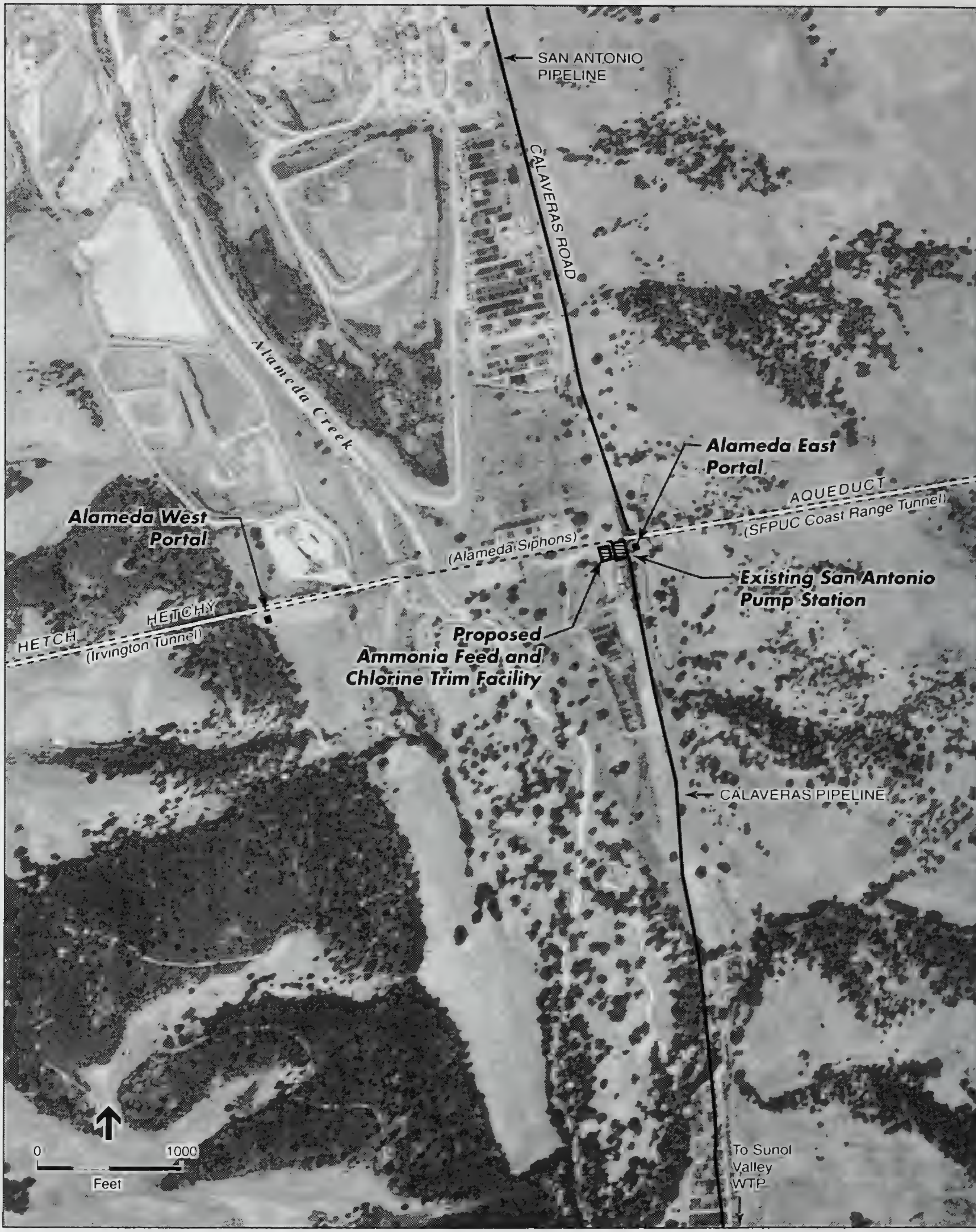
Figure III-6
Typical Chemical Storage
and Feed Building Section



SOURCE: USGS; Yuki A. Kawaguchi, Cartographer; ESA+Orion, 2000

1998.898E: Hetch Hetchy Water Treatment Chloramine Conversion Project EIR / 990095

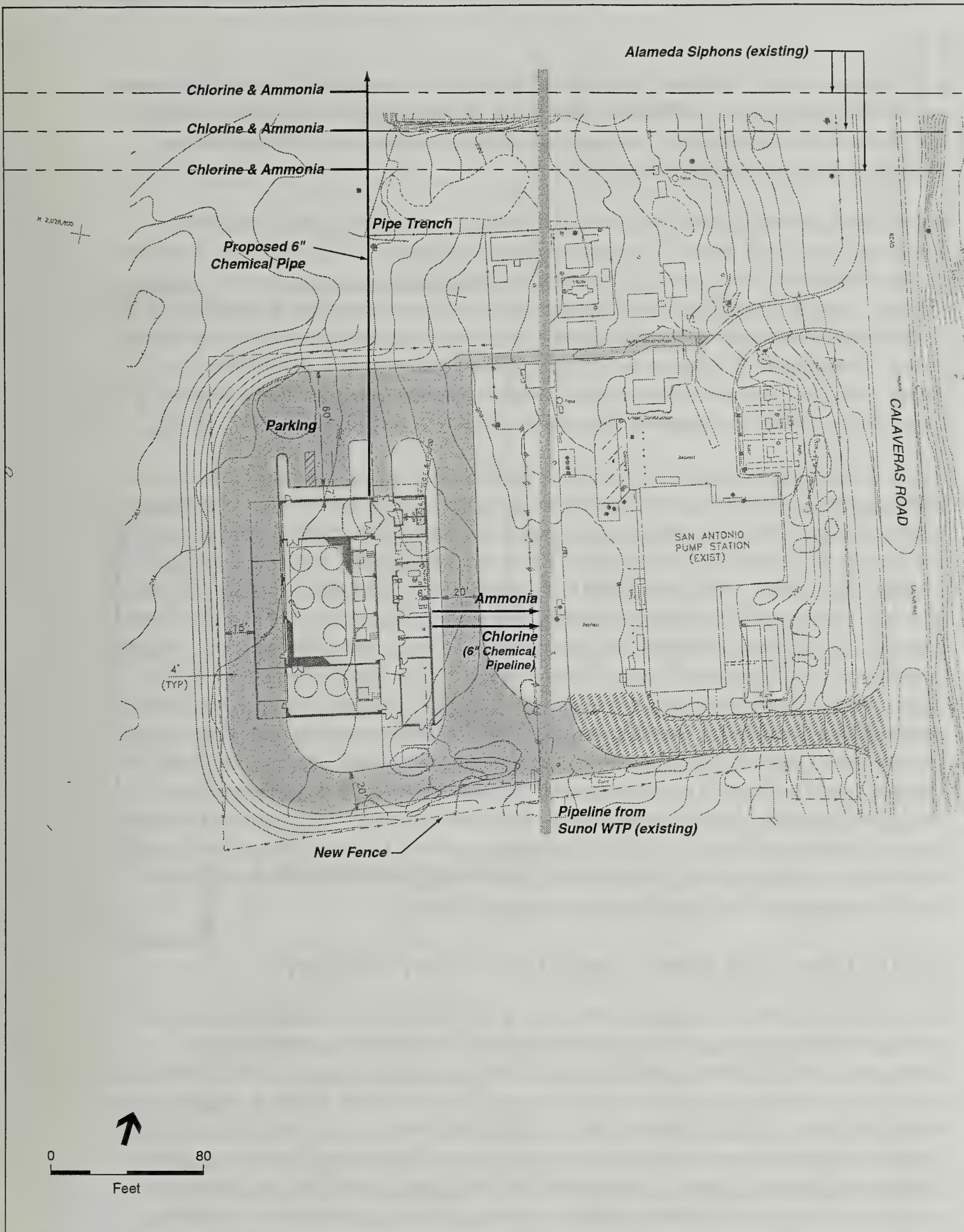
Figure III-7
Sunol Valley Vicinity Map, USGS



SOURCE: Towill, Inc., 1999; ESA+Orion, 2000

1998.898E: Hetch Hetchy Water Treatment Chloramine Conversion Project EIR / 990095

Figure III-8
Sunol Valley
Vicinity Map, Aerial



SOURCE: San Francisco Water Team, 1999

1998.898E: Hetch Hetchy Water Treatment Chloramine Conversion Project EIR / 990095

Figure III-9
San Antonio Ammonia Feed and Chlorine Trim Facility Site Plan

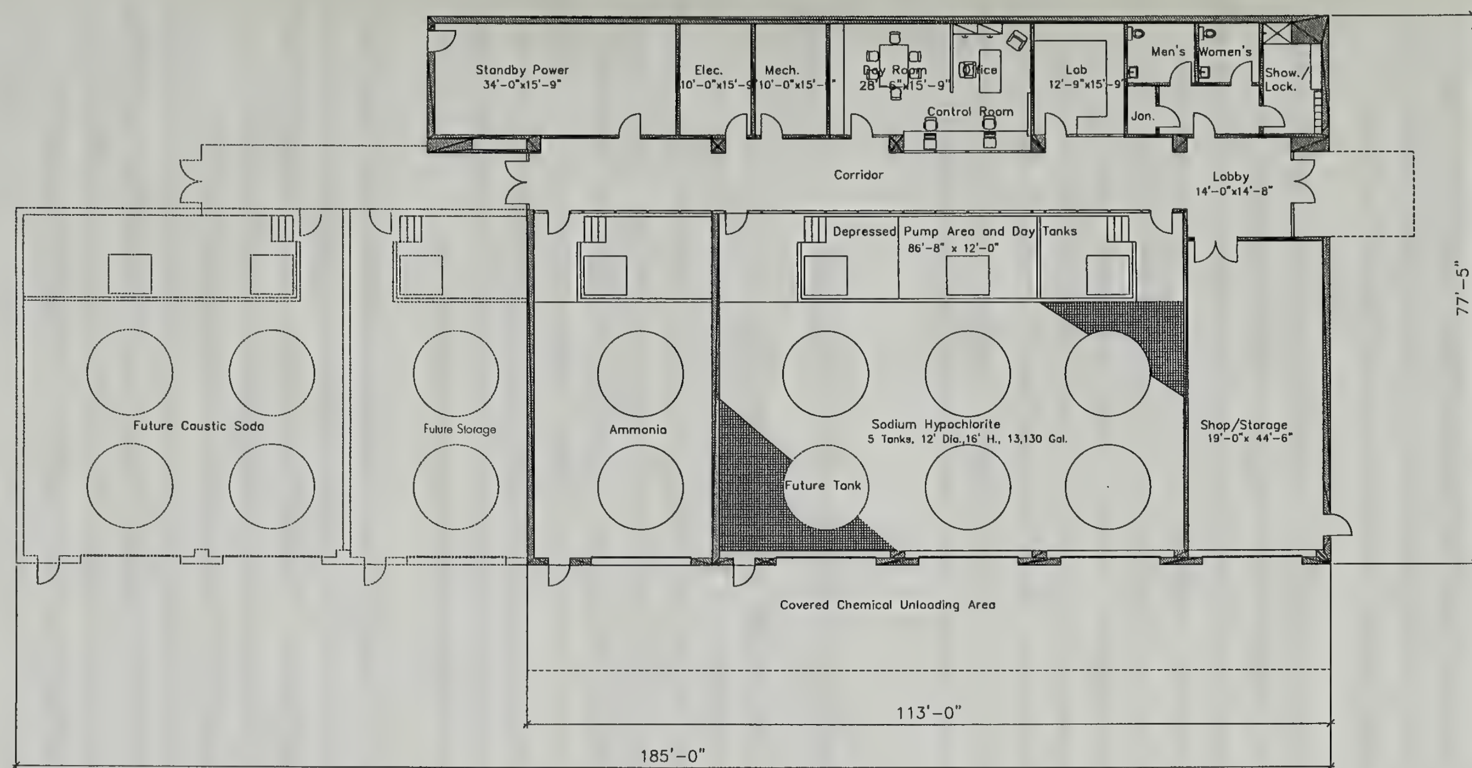
water supply system. At this site, the proposed structure may need to be constructed on a raised pad and could require over 4,000 cubic yards of fill. A new access point off Calaveras Road would be added, and a loop road for chemical deliveries would be constructed around the proposed building and existing pump station.

As described previously, ammonia would be injected into the water supply that has been chlorinated at the Tesla Portal. The ammonia would combine with chlorine already in the water to form chloramine, which would act as a residual disinfectant in the water supply. Additional chlorine would be added as needed to compensate for chlorine losses throughout the system and to maintain required levels of residual chloramine for continued disinfection in the distribution system. The addition of supplemental chlorine is sometimes referred to as "chlorine trim." About 1,000 linear feet of 6-inch-diameter, buried, double-contained pipe would be installed to convey liquid chlorine and ammonia from the new facility to the Alameda Creek Siphons.

Figure III-10 shows a typical floor plan for an ammonia feed and chlorine trim facility, and the building section would be similar to that shown previously for the Tesla Portal Chlorination Facility in Figure III-6. The structure design would be similar to the Tesla Portal Chlorination Facility and with similar dimensions (about 100 feet wide by 150 feet long and 30 feet high). In addition, the structure would be designed to accommodate potential future chemical storage and injection systems, including caustic soda that could be added in the future for corrosion control purposes. As described previously, the future corrosion control system is currently in conceptual planning and would be located either at Tesla Portal or the San Antonio Pump Station. The facility would have two rectangular zones of high and low bay heights. The high bay space would provide clearance for chemical storage and tank-related maintenance, while the low bay space would be used for office, laboratory, and support space. In the high bay space, the chemical would be stored in tanks supported by a concrete slab above a containment area. The feed pumps and tanks would be lower than the main floor level so that chemical feed could occur without a pressure differential. The chemical loading area would be covered and surrounded by berms to protect the area from potential spills. The building orientation and exterior facade would be designed to blend with the surrounding environment.

2.2 ALAMEDA EAST PORTAL DECHLORINATION FACILITY

The Alameda East Portal, sometimes referred to as the Alameda East Shaft, is located at the terminus of the Coast Range Tunnel and is where the Hetch Hetchy water that has been chlorinated at the Tesla Portal enters the Sunol Valley in Alameda County. At this location, there is an overflow structure, valve house, and a temporary dechlorination facility that handles up to 40 million gallons per day. Overflows at the Alameda East Portal occur approximately one to three times per month, and discharges occur automatically when pressure reaches certain levels. The maximum discharge rate is approximately 200,000 gallons per minute, though the rate is controlled to not exceed 40 million gallons per day due to the limits of the 48-inch discharge pipe. The system is typically controlled so that pressures do not exceed levels that would result in overflows greater than 40 million gallons per day, and overflows are not allowed to occur for more than one hour if possible. In the event that overflows exceeded this rate, the pressure would



SOURCE: San Francisco Water Team, 1999

1998.898E: Hetch Hetchy Water Treatment Project-Chloramine Conversion / 990095 ■

Figure III-10

Typical Ammonia Feed and Chlorine Trim Facility
Layout at San Antonio Pump Station Site

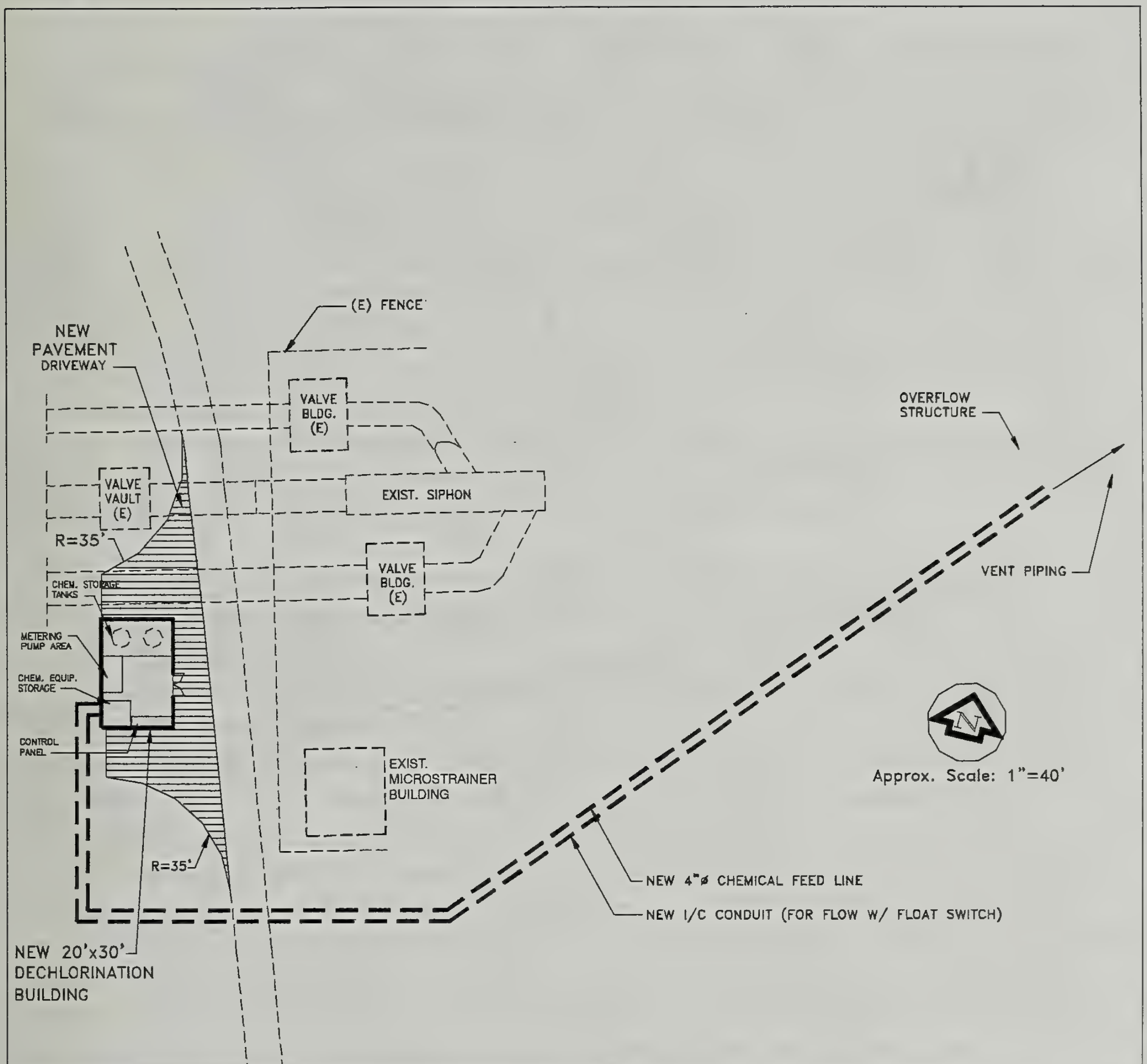
be detected from readings in the Coast Range Tunnel, and the water would be pumped to San Antonio Reservoir or San Antonio Creek rather than overflow at Alameda East Portal. The discharge flows through a 48-inch-diameter pipe and drainage ditch through a commercial nursery a distance of about 1,500 feet to Alameda Creek. These limited overflows normally seep into the ground before reaching Alameda Creek (San Francisco Water Team, 1999b). The chemicals used for dechlorination are currently stored at the San Antonio Pump Station and transferred as needed to the temporary dechlorination facility at the Alameda East Portal.

The proposed project would include construction of a permanent dechlorination facility at the existing Alameda East Portal. This facility would be designed to protect Alameda Creek water quality from discharges of chlorinated water from this shaft and to increase reliability compared to that provided by the existing temporary dechlorination facility. The proposed permanent structure would be about 20 feet wide by 30 feet long and 12 feet high and would house a chemical metering pump, chemical equipment, chemical storage, and control panel. The new facility would require a new pavement driveway and would be within 50 feet of the existing structures and valve houses at this location. About 200 linear feet of 4- to 6-inch, buried, double-contained pipe would be installed to carry a chemical solution of sodium thiosulfate to the water supply. A schematic of the proposed Alameda East Dechlorination Facility is shown in Figure III-11.

2.3 ALAMEDA WEST PORTAL DECHLORINATION FACILITY

The Alameda West Portal, sometimes referred to as the Alameda West Shaft, is located at the west end of the Sunol Valley at the terminus of the Alameda Creek Siphons and at the entry to the Irvington Tunnel. The Alameda Creek Siphons convey Hetch Hetchy water below grade under Alameda Creek from Alameda East Portal to the Alameda West Portal. At this location, there is an overflow structure and valve houses, and automatic discharges can occur here. Overflows drain to Alameda Creek (San Francisco Water Team, 1999b). However, information on historical discharges from this location is not available, and there are indications that overflows have not occurred in recent years due to operational changes in the Sunol Valley. If the proposed project is implemented, there is a potential for chloraminated discharges from this site.

To eliminate the potential impact of chlorine present in discharges of chloraminated water from the Alameda West Portal to Alameda Creek, the proposed project would include construction of a permanent dechlorination facility at this site. If needed, this facility would be designed similar to that for the Alameda East Portal. The proposed permanent structure would be about 20 feet wide by 30 feet long and 12 feet high and would house a chemical metering pump, chemical equipment, chemical storage, and control panel. The new facility would require a new pavement driveway and would be within 50 feet of the existing structures and valve houses at this location. About 200 linear feet of 4- to 6-inch, buried, double-contained pipe would be installed to carry a chemical solution of sodium thiosulfate to the water supply. A schematic of the proposed Alameda West Dechlorination Facility is shown in Figure III-12.

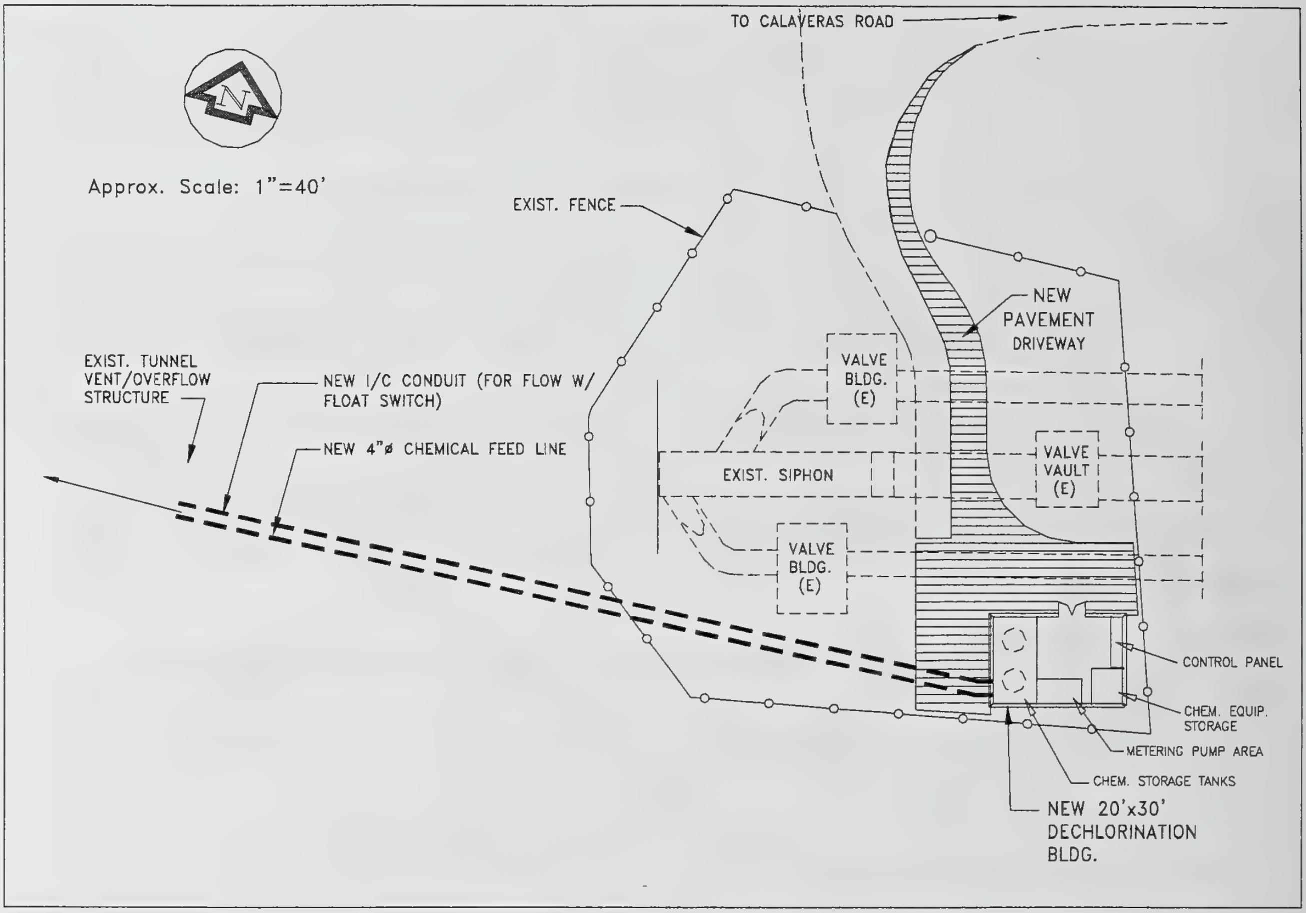


SOURCE: F.E. Jordan Associates, Inc., 2000

1998.898E: Hetch Hetchy Water Treatment Project-Chloramine Conversion / 990095

Figure III-11

Alameda East Dechlorination Facility Site Plan



SOURCE: F.E. Jordan Associates, Inc., 2000

1998.898E: Hetch Hetchy Water Treatment Project-Chloramine Conversion / 990095 ■

Figure III-12
Alameda West Dechlorination Facility Site Plan

3.0 PULGAS SITE FACILITIES

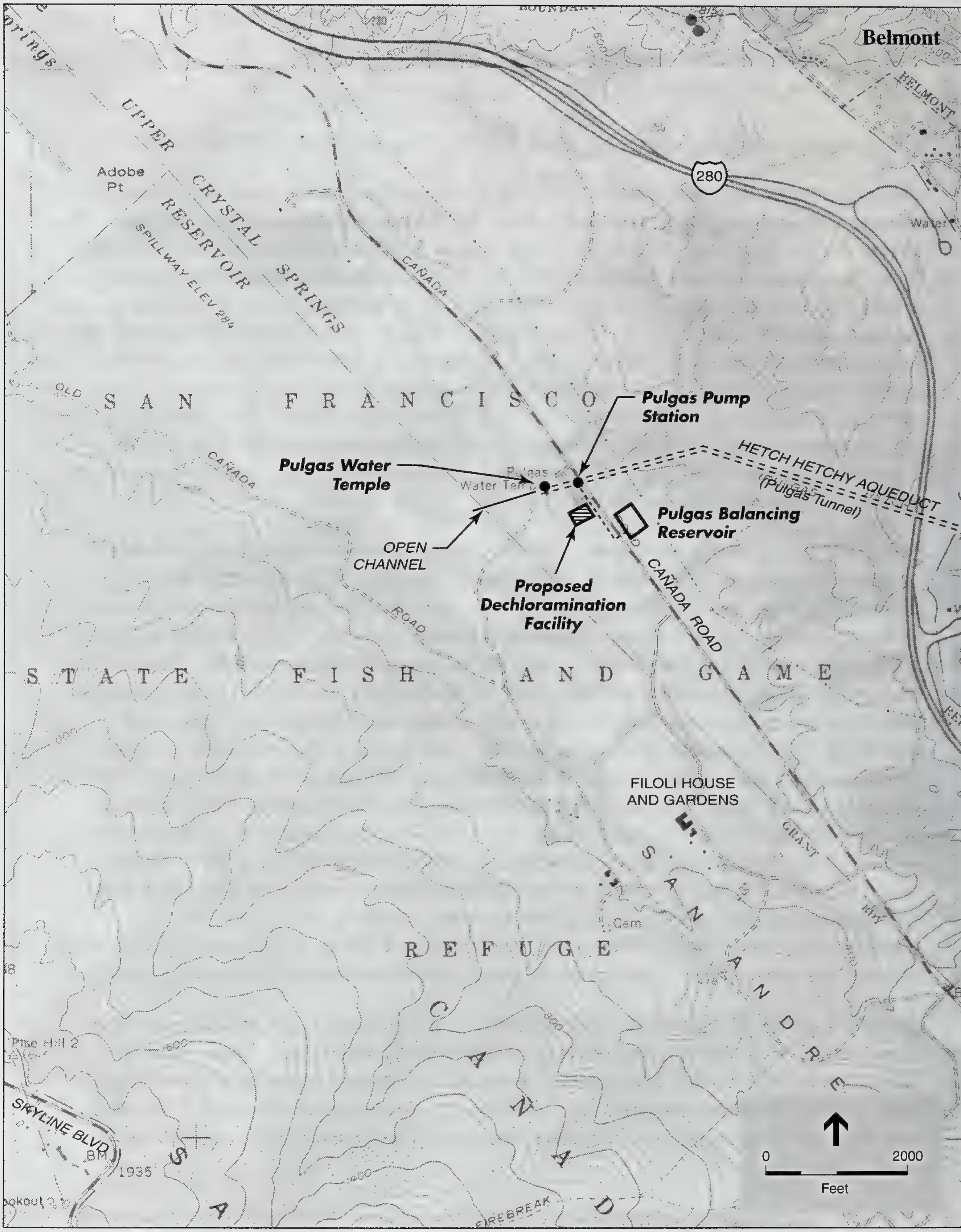
3.1 PULGAS DECHLORAMINATION FACILITY AND CONTACTOR PIPELINE

The Pulgas Water Temple on Cañada Road near Woodside, San Mateo County is the historical site where Hetch Hetchy water emerges from the Bay Division Pipelines and flows to Upper Crystal Springs Reservoir. Other SFPUC water system facilities in this area include the Pulgas Pump Station and the Pulgas Balancing Reservoir. The pump station is located underground directly opposite the temple; it is activated when supplies in the Pulgas Tunnel exceed the demand in the downstream Crystal Springs Bypass Tunnel, at which times it pumps excess water to be stored in the Balancing Reservoir. The Pulgas Balancing Reservoir is a partially buried, covered storage facility with a capacity of 60 million gallons, located across Cañada Road from the temple, slightly to the south. It is used to regulate flows between the Pulgas Tunnel and Crystal Springs Bypass Tunnel; excess water planned for long-term storage spills to Upper Crystal Springs Reservoir. The existing and proposed sites of SFPUC facilities in the vicinity of the temple are shown in Figures III-13 and III-14.

This component of the proposed project consists of a new dechloramination facility to remove chlorine and to reduce ammonia levels prior to discharge of SFPUC system water to Crystal Springs Reservoir. The facility would include an aboveground chemical storage structure and operations building and an underground contactor facility consisting of either 4,600 linear feet of 10- to 12-foot-diameter contactor pipeline or a 65,000-square-foot contactor basin. The chemical storage and operations building would be about 100 feet wide by 200 feet long and 30 feet high and would accommodate chemical storage as well as chemical metering pumps and related equipment. In addition, to provide adequate contact time to reduce ammonia levels, a pipeline contactor or an underground contactor basin would be installed adjacent to the proposed chemical storage structure. About 1,000 linear feet of 6-inch-diameter, buried, double-contained piping would be installed to carry liquid chemicals. A 10- to 12-foot-diameter buried pipeline to divert water from the Pulgas Pump Station, located about 350 feet east of the Pulgas Water Temple, would be installed to convey water to the dechloramination facility for removal of chlorine and reduction of ammonia. Another pipeline with the same diameter would convey the dechloraminated water back from the dechloramination facility to the existing open channel about 100 feet behind the temple. The locations of these proposed facilities are shown in Figure III-15.

The preferred site for the dechloramination facility is in a meadow along a row of mature trees directly south of the public parking lot at the Pulgas Water Temple. The structure would be located about 600 feet south of the temple. A new access driveway would be built on Cañada Road south of the public parking lot, and a 300-foot-long truck turnaround would be built at the end of the 200-foot-long drive with a connection to an existing gravel service road behind the public parking lot.

Figure III-16 shows a typical floor plan for the dechloramination chemical building at the Pulgas site. The building section would be similar to that shown previously in Figure III-6 for the Tesla Portal chlorination and the San Antonio Pump Station chlorine and ammonia feed facilities. The dechloramination chemical building design would be similar to the previous two facilities, with



SOURCE: USGS; Yuki A. Kawaguchi, Cartographer; ESA+Orion, 2000

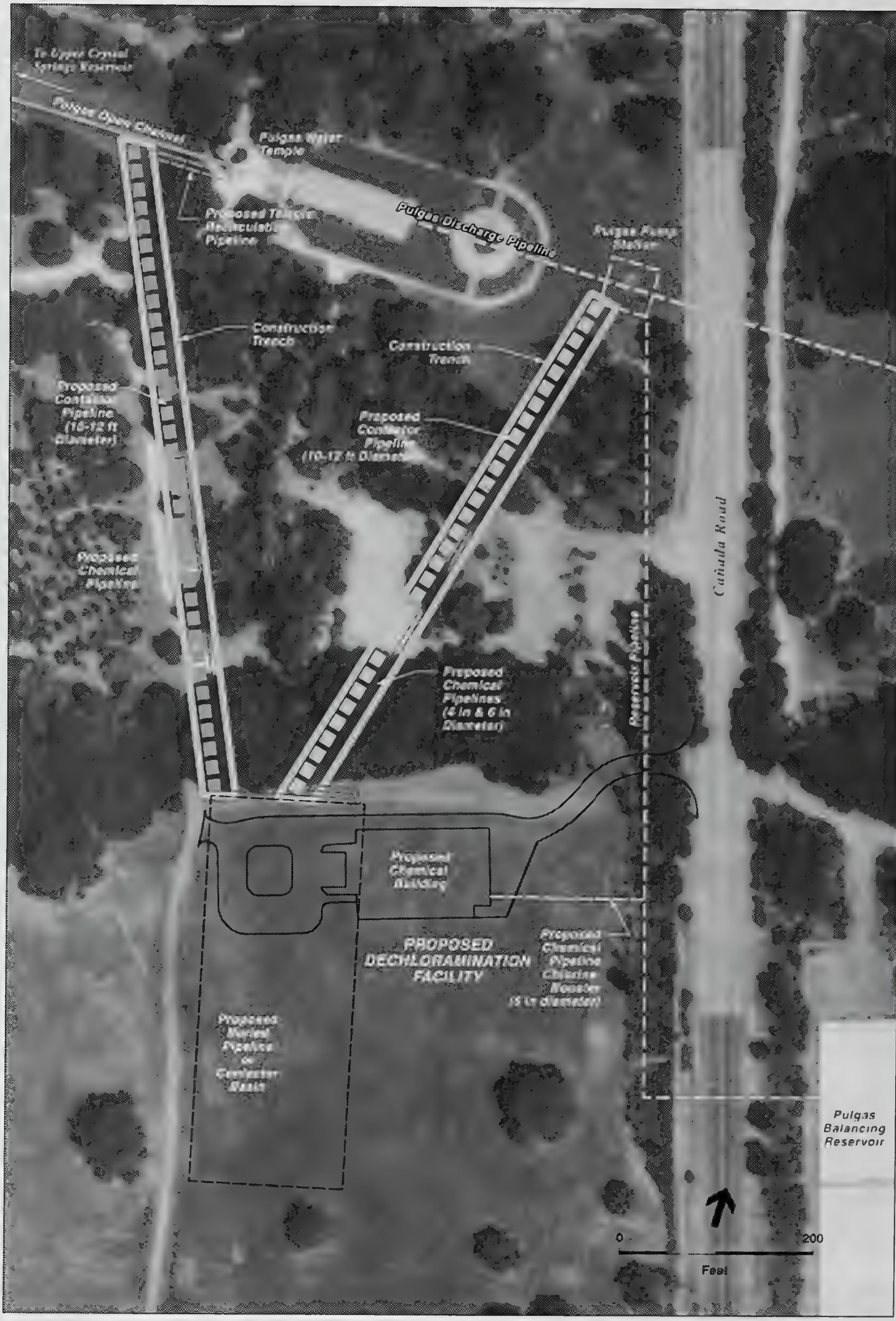
1998.898E: Hetch Hetchy Water Treatment Chloramine Conversion Project EIR / 990095

Figure III-13
Pulgas Water Temple
Vicinity Map, USGS

SOURCE: Towill, Inc., 1997; ESA+Orion, 2000

1998.898E: Hetch Hetchy Water Treatment Chloramine Conversion Project EIR / 990095

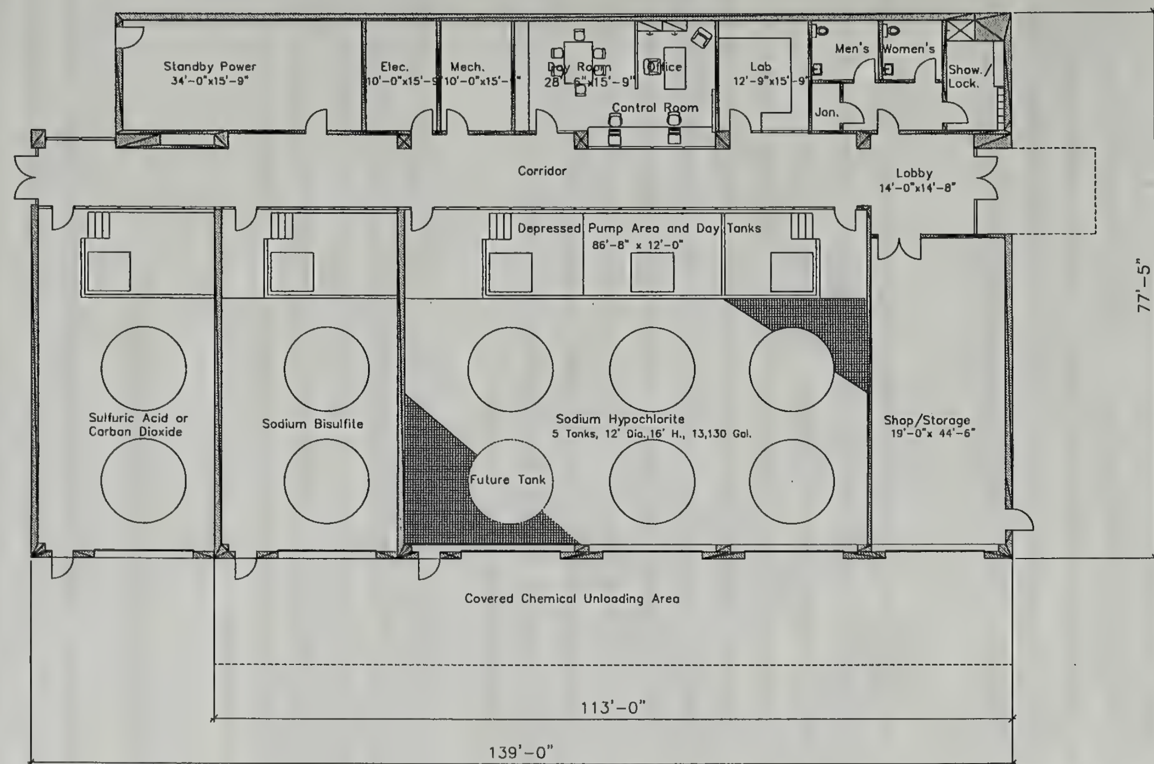
Figure III-14
Pulgas Water Temple
Vicinity Map, Aerial



SOURCE: SFPUC; Yuki A. Kawaguchi, Cartographer; ESA+Orion, 2000

— 1998.898E: Hetch Hetchy Water Treatment Project-Chloramine Conversion / 990095 ■

Figure III-15
Pulgas Site Dechloramination Facility and Pipeline Site Plan



SOURCE: San Francisco Water Team, 1999

1998.898E: Hetch Hetchy Water Treatment Project-Chloramine Conversion / 990095 ■

Figure III-16

Typical Layout for Chlorination/Dechloramination Facilities at Pulgas Site

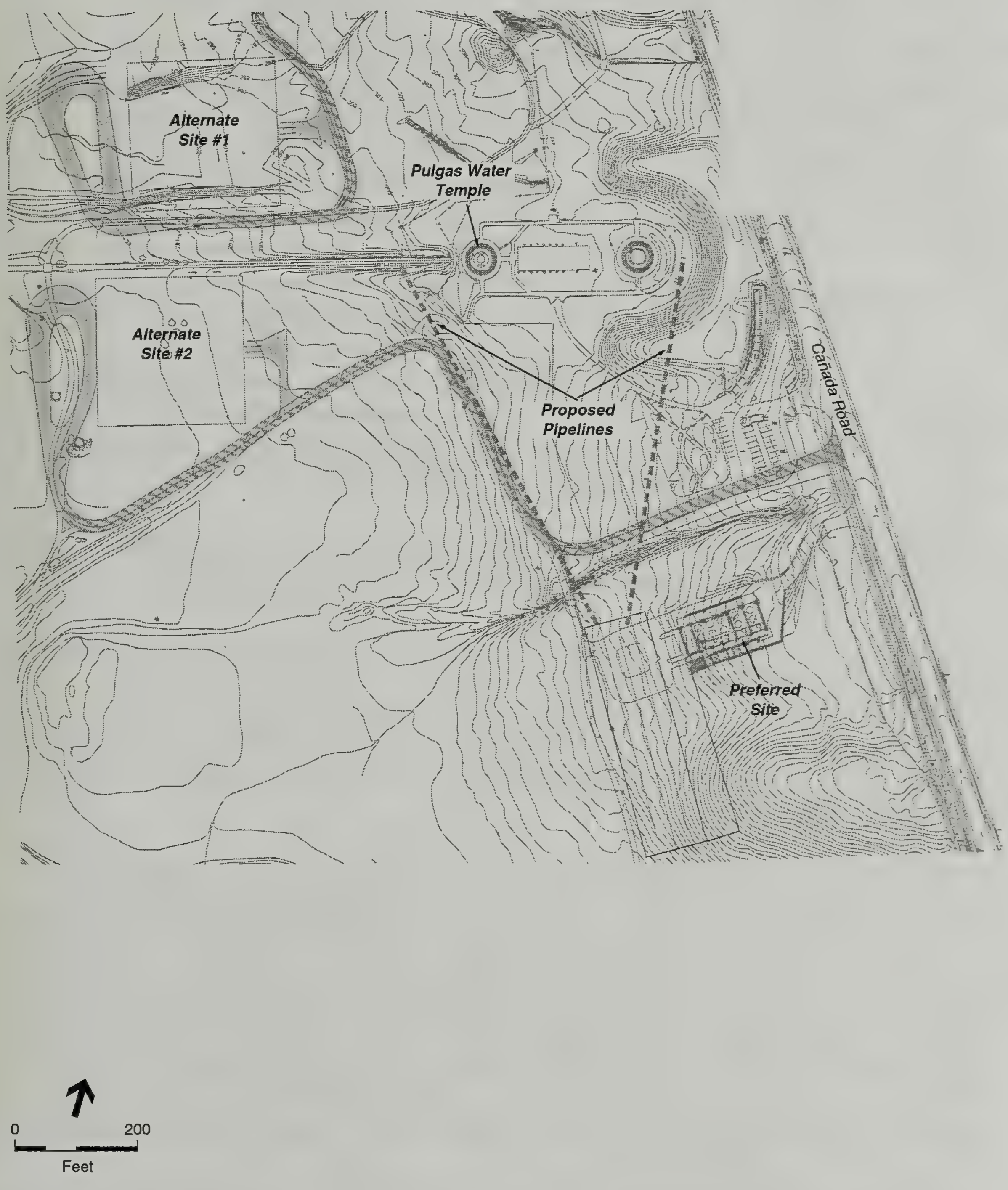
two rectangular zones of high and low bay heights. The high bay space would provide clearance for chemical storage and tank-related maintenance, while the low bay space would be used for office, laboratory, and support space. Restroom facilities would either be connected to a septic system or the local sanitary sewer. Because the facility would only be staffed intermittently, the sanitary sewer volumes would be low. In the high bay space, the chemicals would be stored in tanks supported by a concrete slab above a containment area. The feed pumps and tanks would be lower than the main floor level so that chemical feed could occur without a pressure differential. The chemical loading area would be covered and hidden from view using a screening wall. The building orientation and exterior facade would be designed to blend with the surrounding environment, and landscaping would be developed to screen views of the facility from Cañada Road. As part of the proposed project, the SFPUC would schedule chemical deliveries to this facility from Monday to Saturday only and would permit Sunday deliveries only in emergency situations.

The proposed dechloramination facility would divert the water flow away from the Pulgas Water Temple proper, eliminating the sound of water flowing under the historic structure (a grate obscures the appearance of flowing water under the temple). Although water at the temple currently flows intermittently, the project would include provisions to mimic the sound of flowing water at the temple in order to maintain this aspect of the historic integrity of the temple. The project would restore the sound of flowing water at the temple with design features, such as a pumping system to transfer a small stream of dechloraminated water back through the temple on a scheduled or planned basis when water is flowing. The pipeline would either be buried or submerged within the water channel downstream of the temple. When the water is flowing, the pump system could be controlled to operate during specific hours each day or only during specific events. These facilities are also indicated in Figure III-15.

Two alternative sites for the dechloramination facility were also considered and are analyzed in this EIR. Alternative Sites No. 1 and No. 2 are located about 600 feet west and 600 feet northwest of the Pulgas Water Temple, respectively, as shown in Figure III-17. These sites are both currently vacant and have no public access. Both sites are located further away from Cañada Road and closer to Crystal Springs Reservoir; both would require a more extensive access roadway than the preferred site location.

3.2 PULGAS BALANCING RESERVOIR IMPROVEMENTS

This component of the proposed project consists of reservoir upgrades to the Pulgas Balancing Reservoir, located east of Cañada Road near the Pulgas Water Temple. The Pulgas Balancing Reservoir, also known as the Crystal Springs Balancing Reservoir, is a 60-million-gallon-capacity reservoir built in 1975. It is a covered, mostly buried storage facility made of reinforced concrete with corrugated-aluminum roofing above grade, and it is used to regulate flows between the Pulgas Tunnel and Crystal Springs Reservoir. It has a single inlet and outlet where water is either pumped from the Pulgas Pump Station into the Balancing Reservoir or flows by gravity from the Balancing Reservoir to the Pulgas Tunnel or Crystal Springs Reservoir. There is currently no chlorination system at this facility, although operations staff occasionally add hypochlorite



SOURCE: San Francisco Water Team, 1999

1998.898E: Hetch Hetchy Water Treatment Chloramine Conversion Project EIR / 990095

Figure III-17
Pulgas Dechloramination Facility
and Alternative Sites

directly into the Balancing Reservoir (San Francisco Water Team, 1999b). The existing reservoir configuration results in long detention times that could cause water quality concerns if chloramine were used as the residual disinfectant. Therefore, the proposed project would include improvements to eliminate these concerns.

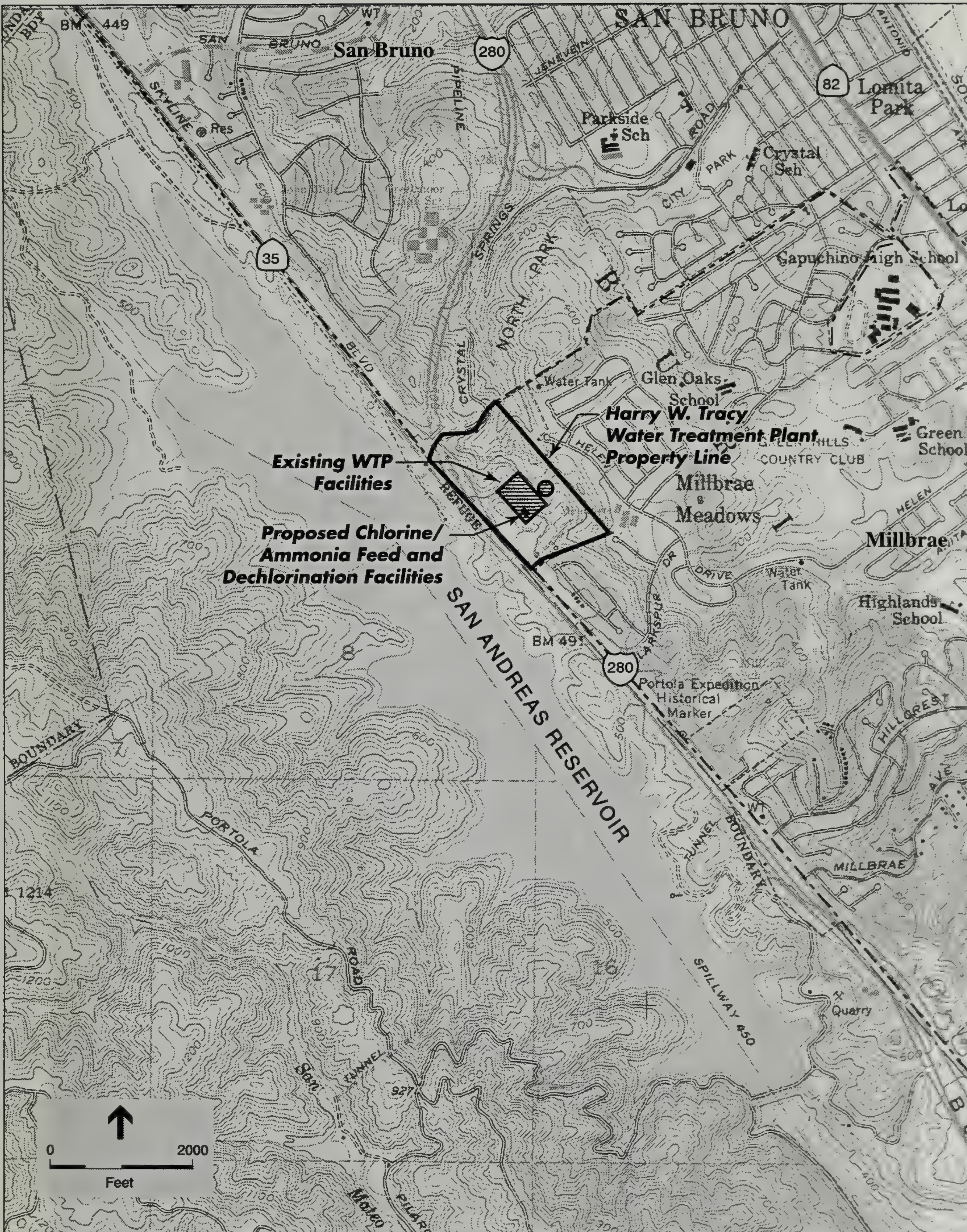
The proposed upgrades to the Pulgas Balancing Reservoir consist of internal piping changes and modifications to the existing inlet and outlet structure. These improvements would reduce detention time and increase mixing conditions and thus improve overall circulation in the reservoir. This upgrade would reduce the potential for nitrification,[3] which is an adverse process that can occur when chloraminated water is stored for long periods of time with insufficient mixing. In addition, it may be necessary to add additional chlorine at this reservoir to maintain adequate levels of residual chloramine disinfectant. Therefore, chlorine-boosting facilities would be included at the dechloramination facility to pump chlorine to the Pulgas Balancing Reservoir as necessary. This component would require installation of about 500 linear feet of 6-inch, buried, double-contained pipeline to deliver chlorine to an existing pipeline that connects the Pulgas Balancing Reservoir to the Pulgas Pump Station. The proposed chemical pipeline and the Pulgas Balancing Reservoir are shown in Figure III-15. Construction of the proposed improvements would require that the Balancing Reservoir be taken temporarily out of service, which would be conducted without disruption of water service to customers.

4.0 HARRY W. TRACY WATER TREATMENT PLANT CHLORINE AND AMMONIA FEED AND DECHLORINATION FACILITIES

The Harry W. Tracy WTP (originally called the San Andreas WTP), located on Crystal Springs Road in San Bruno, San Mateo County, began operation in 1972 and has been subsequently upgraded and expanded. The WTP provides ozonation, coagulation, filtration, chlorination, and fluoridation to raw water from the San Andreas Reservoir and serves SFPUC customers at upper elevations in Millbrae and San Francisco. Figures III-18 and III-19 show the Harry W. Tracy WTP and surrounding areas.

New chlorine and ammonia storage and feed facilities would be built at the WTP at one of two locations within the WTP boundaries. The new chlorine facility would require an area about 40 feet wide by 40 feet long and 30 feet high, while the new ammonia facility would require an area about 30 feet wide by 50 feet long and 30 feet high. Both chemical facilities would use the existing operations building at the WTP for ancillary equipment, controls, and staff. About 1,100 linear feet of buried chemical pipeline, 2 to 4 inches in diameter and double-contained, would be installed. The two separate chemical pipelines for chlorine and ammonia would be installed in the same 550-foot-long trench. The proposed chlorine facility would be used to supplement the existing chlorination system for both primary and residual disinfection, and the

[3] Nitrification is the biological oxidation of ammonia. It is caused by proliferation of nitrifying bacteria that oxidize ammonia to nitrite and nitrate. Contributing factors generally include long detention times, elevated temperature, excess ammonia, and low chloramine residual. The result of nitrification is a depletion of disinfectant residual that may lead to increased growth of bacteria and pathogenic organisms.



SOURCE: USGS; Yuki A. Kawaguchi, Cartographer; ESA+Orion, 2000

1998.898E: Hetch Hetchy Water Treatment Chloramine Conversion Project EIR / 990095

Figure III-18
Harry W. Tracy Water Treatment Plant
Vicinity Map, USGS

SOURCE: Towill, Inc., 1997; ESA+Orion, 2000

-1998.898E: Hetch Hetchy Water Treatment Chloramine Conversion Project EIR / 990095

Figure III-19
Harry W. Tracy Water Treatment Plant
Vicinity Map, Aerial

proposed ammonia facility would be used to combine ammonia with the chlorine to form chloramine for residual disinfection.

In addition, the proposed project would include construction of a permanent dechlorination facility adjacent to the existing treated water reservoir to replace the currently used portable dechlorination trailer at this site. Currently, during upsets at the WTP, the chlorinated water in the treated water reservoir is discharged to San Andreas Reservoir, and the portable dechlorination trailer is used to remove chlorine from these discharges. The proposed dechlorination facility would contain chemical storage tanks and pumps and would occupy an area about 10 feet by 12 feet with a maximum height of 10 feet. About 10 feet of 2-inch-diameter piping would be needed to connect this facility with the existing chemical injection piping. It is estimated that this facility would be used two to four times per year.

Figure III-20 shows the proposed locations of the chlorine and ammonia storage and feed systems and the permanent dechlorination facility at the Harry W. Tracy WTP.

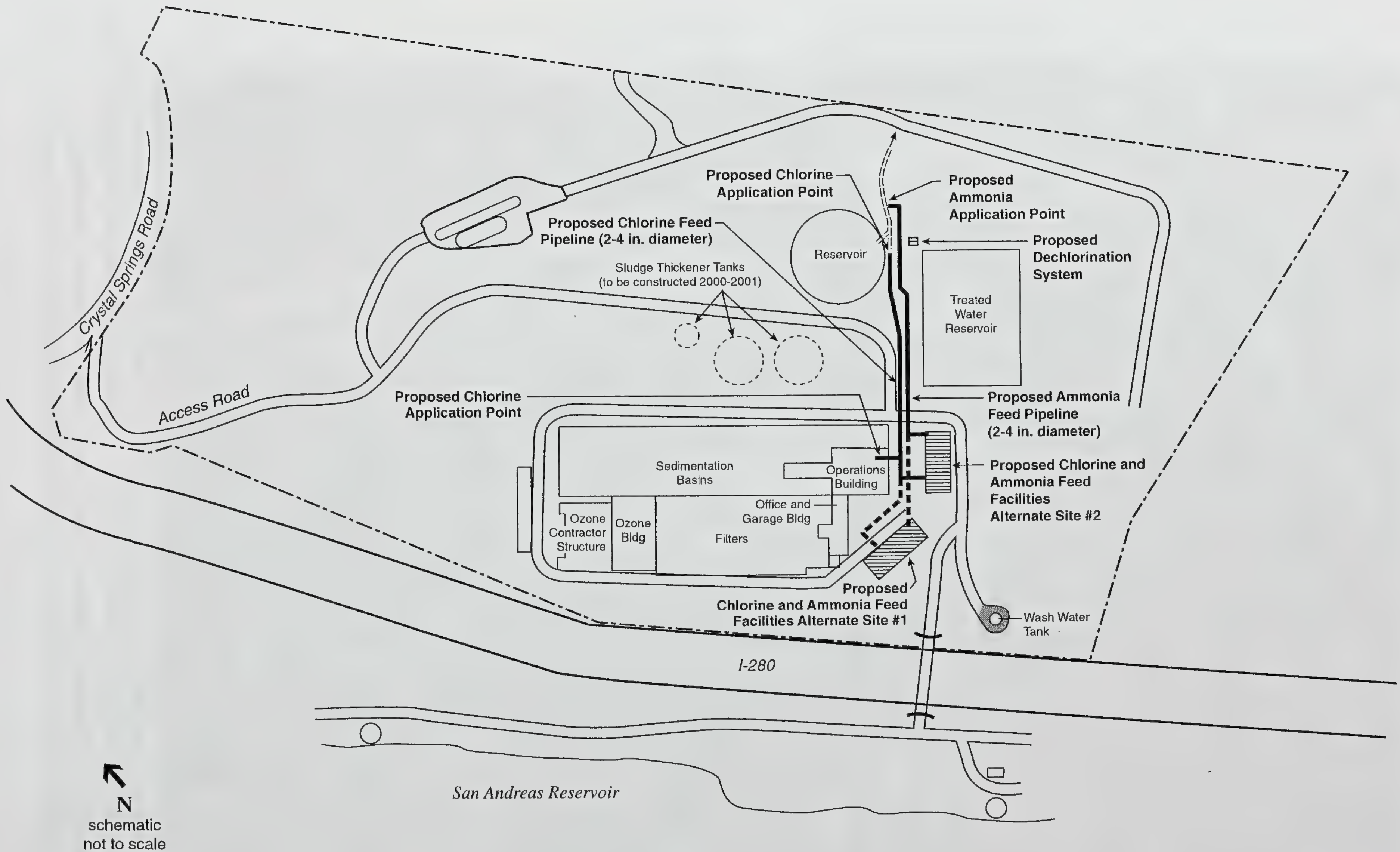
F. PROPOSED FACILITIES – PROGRAM-LEVEL ANALYSIS

In addition to the new construction at the four facility locations described above, the Hetch Hetchy Water Treatment Project--Chloramine Conversion would require new facilities or modifications to existing facilities at other locations along the SFPUC water supply system or within the SFPUC service area. The proposed project would also require changes in operations and/or maintenance at other SFPUC facilities to accommodate the systemwide conversion of residual disinfectant. These components of the proposed project fall into three categories of facilities: (1) secondary discharge locations in Alameda, San Mateo, and San Francisco Counties where planned water discharges or incidental overflows may occur, (2) the City Distribution Division water distribution facilities in San Francisco, and (3) the BAWUA member agencies' storage, treatment, and distribution facilities in San Mateo, Santa Clara, and Alameda Counties.

At this time, site-specific engineering and design information are not available for these project components. Therefore, these components are analyzed at a *program level* in this EIR. A program level of analysis is performed when site-specific analysis is not currently possible or is not applicable. Instead, the environmental analysis is based on a typical scenario of similar, related facilities. Depending on site-specific design and siting conditions, some aspects of these project components may require additional environmental review when site-specific information becomes available, subsequent to this EIR. The project components analyzed at a program level are described below and are also listed in Table III-1.

1.0 DECHLORINATION FACILITIES AT SECONDARY DISCHARGE LOCATIONS

Secondary discharge locations are locations along the SFPUC water supply system where water is either intentionally discharged (i.e., water transfers) or incidentally overflows into local surface water bodies due to operational requirements of the system. There are about ten identified secondary discharge locations downstream of the Tesla Portal that could be affected by the



SOURCE: Yuki A. Kawaguchi, Cartographer, 2000

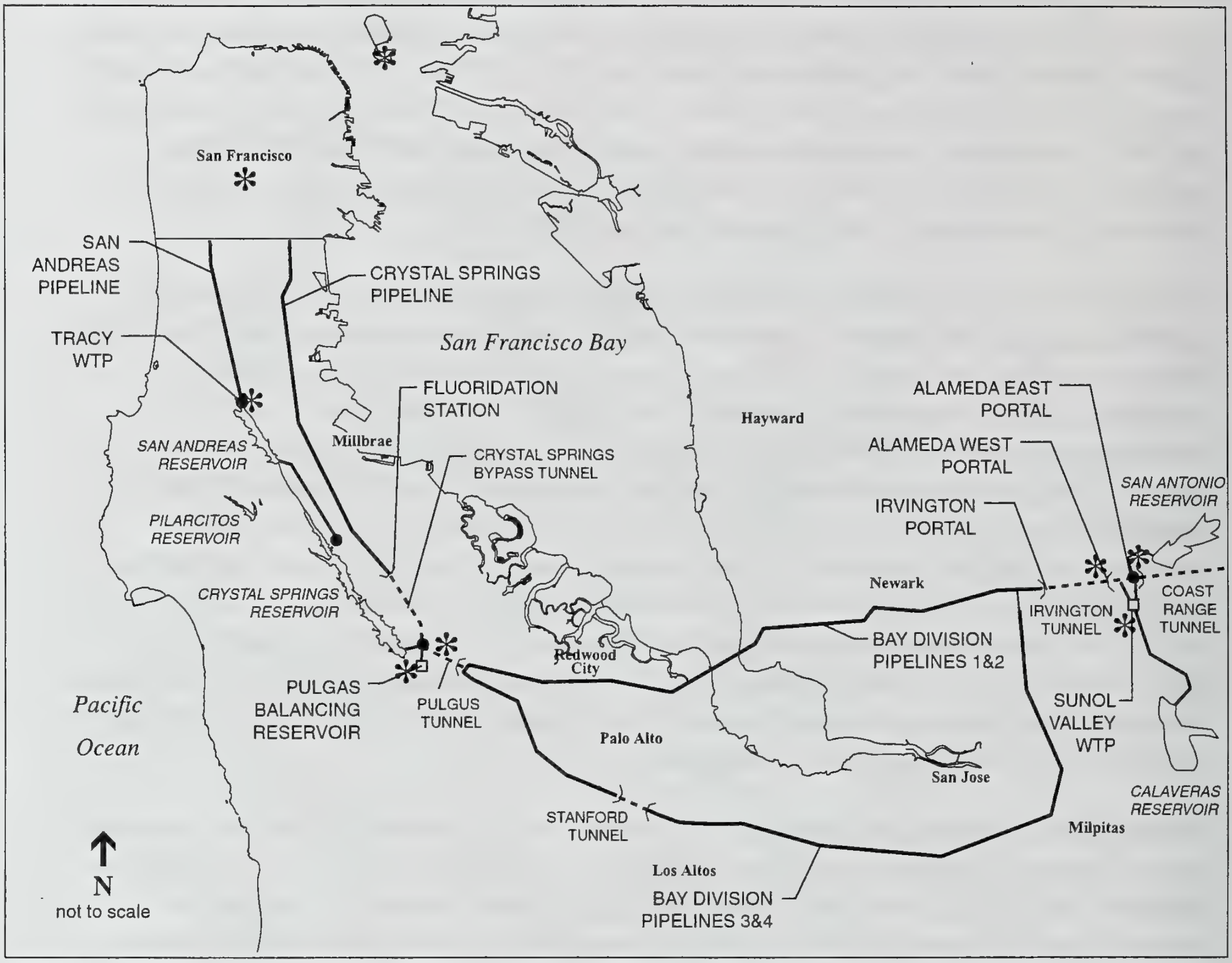
1998.898E: Hetch Hetchy Water Treatment Project-Chloramine Conversion / 990095

Figure III-20
Harry W. Tracy Water Treatment Plant
Facilities Site Plan

proposed project. Alameda East Portal and Alameda West Portal are two of these locations. As described above, permanent dechlorination facilities would be constructed at these two locations in order to protect surface waters from discharge of chlorine from chlorinated or chloraminated water. The other identified secondary discharge locations where incidental overflows may occur include: Pulgas Tunnel, Pulgas Balancing Reservoir, Harry W. Tracy WTP (at various process locations), City distribution reservoirs (various locations), and Yerba Buena Island. In addition, the SFPUC occasionally conducts planned discharges of drinking water (also called water transfers) to Lake Merced in San Francisco via the Lake Merced Pump Station. The general locations of these secondary discharges are shown in Figure III-21.

At each of these secondary discharge locations, the proposed project would provide permanent facilities or operational changes to assure that chlorine would be removed from any chlorinated or chloraminated water discharged to local surface waters. Such provisions could include construction of a permanent dechlorination facility structure; implementation of a portable, trailer-mounted facility; or incorporation of dechlorination facilities into ongoing improvement projects. These facilities would remove chlorine from the chloraminated water supply prior to discharge to creeks or local surface waters, as required by the RWQCB to protect aquatic resources. At this time, it is anticipated that ammonia removal would not be necessary at these locations due to the infrequent and low volume of the discharges. However, at some locations, such as Lake Merced, additional studies are being conducted to determine site-specific water quality conditions and whether ammonia removal is necessary. Specific design of dechlorination facilities has not yet been determined at each of the secondary discharge locations. However, the general types of possible facilities are described below.

Permanent dechlorination facilities would be similar in size and design to the facilities described above for the Alameda East Portal, Alameda West Portal, and Harry W. Tracy WTP and shown in Figures III-11, III-12, and III-20. Permanent facilities would generally be constructed at locations where automatic overflows occur. Portable, trailer-mounted chemical feed systems, consisting of chemical metering pumps and limited chemical storage, would be used at locations where controlled discharges or planned water transfers are conducted. These planned events, which historically have occurred only a few times each year, require that water be dechlorinated prior to discharge to a surface water body. Typically, the chemicals used for dechlorination are sodium thiosulfate or sodium bisulfite, which are not harmful to the aquatic environment when added to chlorinated water at the doses required for dechlorination. This component of the proposed project would not alter the location or frequency of secondary discharges, but it would ensure removal of chlorine from chlorinated or chloraminated water before discharge to surface waters. When site-specific information becomes available regarding the facility site and design at individual discharge locations, more detailed environmental review may be required to address any site-specific sensitive issues (e.g., construction impacts, geotechnical hazards, drainage, biological or cultural resources) associated with a permanent dechlorination structure.



Secondary Discharge Locations

SOURCE: San Francisco Water Team, 1999

1998.898E: Hetch Hetchy Water Treatment Project-Chloramine Conversion / 990095

Figure III-21
Secondary Discharge Locations

2.0 MODIFICATIONS TO CITY DISTRIBUTION DIVISION SYSTEM

The SFPUC's City Distribution Division (CDD) is responsible for operating and maintaining the water system within San Francisco. The proposed project would change the residual disinfectant in this system and would increase the potential for nitrification to occur in treated water reservoirs. As described previously under the Pulgas Balancing Reservoir, nitrification is an adverse process that can lead to growth of harmful bacteria and can occur when chloraminated water is stored for long periods of time with insufficient mixing. Although the CDD has ongoing programs to address nitrification in its reservoirs, the proposed project would require some changes to the CDD system operations prior to chloramine conversion to ensure that water quality to SFPUC customers would be maintained. The ongoing CDD improvement program is described briefly under Section III.I, Related Projects and Plans, and in more detail in Section VI.B, Summary of Cumulative Environmental Effects.

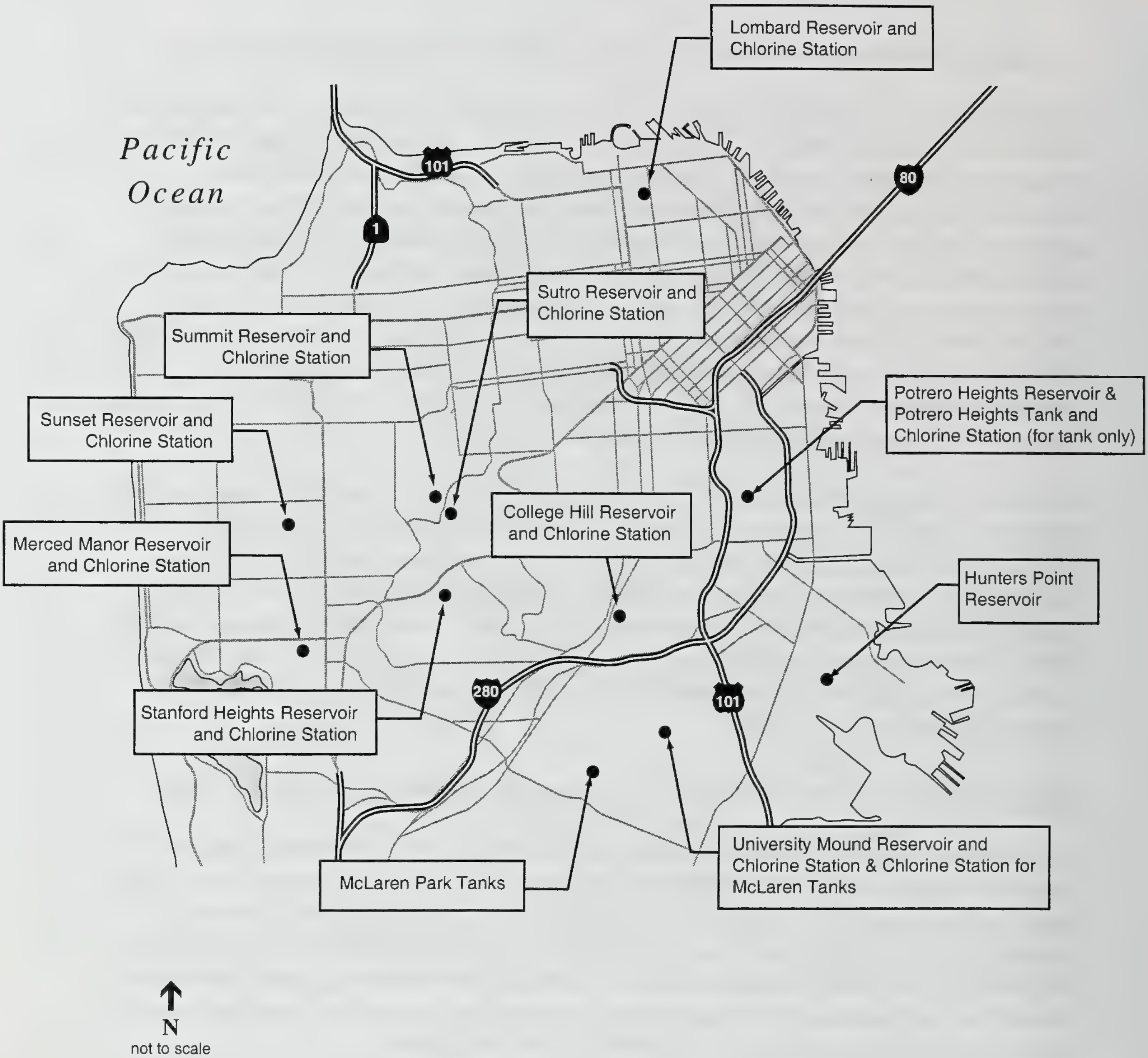
Although specific modifications may vary for the various elements of the CDD system, the major operational modifications that may be required due to chloramine conversion to control nitrification and to improve water circulation could include: cleaning reservoirs and flushing pipelines prior to chloramine conversion; increasing water quality monitoring; and increasing frequency of reservoir drawdowns. In addition, other reservoir improvements that may be needed due to the proposed project include installation of internal reservoir mixing devices and portable mixing and sampling devices to detect nitrification. The locations of the City's treated water reservoirs are shown in Figure III-22.

3.0 MODIFICATION TO BAWUA MEMBER AGENCIES' FACILITIES

As described in Chapter II, under the heading "SFPUC Service Area," the BAWUA member agencies purchase water from the SFPUC on a wholesale basis. Before distributing water to the general public and retail customers within their individual service areas, BAWUA member agencies provide any additional storage, treatment, and conveyance facilities that may be needed. The change in water quality associated with the chloramine conversion may require operational or structural modifications of existing facilities or may require construction of new facilities at the water distribution systems operated by the BAWUA member agencies.

Many of the operational or structural modifications needed for the BAWUA member agency systems would be similar to those needed for the SFPUC transmission or distribution systems. However, unlike the CDD system, which exclusively uses SFPUC water, some BAWUA agencies combine water from different supply sources. A concern for these BAWUA agencies would be the need to make adjustments when blending chloraminated SFPUC water with other water supplies, including chlorinated, other chloraminated, or unchlorinated water supplies.

Structural and/or operational modifications of the BAWUA members' water systems could include the following: new monitoring programs, new chemical feed facilities, reservoir improvements, distribution system modifications, cleaning and flushing programs, and possibly new blending facilities. As required for the SFPUC system, BAWUA agencies may also need to include dechlorination facilities at secondary discharge locations to protect surface waters. Prior



SOURCE: ESA+Orion, 2000;
Yuki A. Kawaguchi, Cartographer

Figure III-22
City Distribution Division
System Map of Major Facilities

to the chloramine conversion, the BAWUA member agencies should conduct a comprehensive evaluation of their individual systems to determine the physical and/or operational modifications needed for their systems.

Because specific modifications that may be necessary within the BAWUA member agencies' systems are not within the scope of this project, this EIR describes typical modifications that may be required and addresses program-level impacts on water quality. When site-specific information is available, further environmental review may be required by the water agencies with jurisdiction over individual projects. Environmental review would be conducted under the auspices of that jurisdiction's California Environmental Quality Act (CEQA) lead agency. Therefore, specific improvements associated with BAWUA members' facilities are not considered in this EIR.

G. CONSTRUCTION SCENARIO

Table III-2 summarizes the construction scenario and various activities that are currently anticipated to occur during construction of proposed facilities at Tesla Portal, San Antonio Pump Station, Alameda East and West Portals, the Pulgas site, Pulgas Balancing Reservoir, and Harry W. Tracy WTP. The construction scenarios for proposed improvements at the CDD and BAWUA member agencies' facilities are not described in this table, since construction activities are currently unknown and would vary with each improvement project. Construction-related impacts (i.e., traffic, air quality, noise, and community disruption) could occur at CDD and BAWUA facilities. Depending on site-specific design and siting conditions, additional environmental review may be required when site-specific information becomes available. Therefore, construction impacts of CDD or BAWUA facilities or modifications due to the proposed project will not be considered further in this EIR.

As indicated in Table III-2, construction of the chlorination facility at Tesla Portal, ammonia and chlorine feed facility at San Antonio Pump Station, dechlorination facilities at Alameda East and West Portals, dechloramination facilities at the Pulgas site, and chlorine and ammonia feed facilities and dechlorination system at Harry W. Tracy WTP would cover areas ranging from approximately 900 to 20,000 square feet on sites of 0.1 to 10 acres. The construction duration for the proposed facilities would vary by site, but would range between 2 and 14 months. None of the proposed buildings would involve extensive excavation because typical buildings would be only partially subgrade (typically 6 to 7 feet below the surface to provide chemical containment). However, as shown in the table, extensive excavation would be required at the Pulgas site for the proposed buried contactor basin and contactor pipeline. Pile driving would not be required at any of the facilities. Although dewatering requirements have not yet been determined, it is anticipated that dewatering would not be required at sites located away from creeks. However, dewatering could be required at the San Antonio Pump Station and Pulgas sites.

Construction of chemical pipelines at all facility sites would be accomplished using standard construction methods, generally the open-cut method (also referred to as the cut-and-cover construction method). Since chemical pipelines would range between 2 and 6 inches in diameter,

TABLE III-2
SUMMARY OF PROJECT CONSTRUCTION SCENARIO AND ACTIVITIES[a]

Construction Activity	Tesla Portal	San Antonio Pump Station	Alameda East or West Portal	Pulgas Site	Pulgas Balancing Reservoir	Harry W. Tracy WTP
Construction Area (acres)	2.2	0.9	0.1	9 to 10	- -[b]	0.07
Facility Area (square feet)	15,000	15,000	900	20,000	- -[b]	3,200
Excavation for buildings and pipelines (cubic yards)	2,800	2,000	60	64,000 (includes contactor basin and pipeline)	- -[b]	740
Concrete Material (cubic yards)	1,000	1,000	50	1,300	75	225
Fill Material (cubic yards)	2,000	4,500	0	44,750[c]	- -[b]	150
Chemical Pipelines (approximate number)	4	16[d]	6	4	1 (not internal)	21
Chemical Pipeline Diameter	6"	4"-6"	4"-6"	4"-6"	6"	2"-4"
Chemical Pipeline Length (approximate linear feet)	300	3,200	200	1,000	500[e]	1,060
Contactor Pipeline Diameter	N/A	N/A	N/A	120"	N/A	N/A
Contactor Pipeline Length (approximate linear feet)	N/A	N/A	N/A	4,600	N/A	N/A
Groundwater Dewatering	ND	ND	ND	ND	ND	ND
Pile Driving	No	No	No	No	No	No
Construction Duration (months)[f]	7	7	2	14	4	5
- Excavation	1	1	0.25	6	N/A	2
- Concrete Placement	2	2	0.5	3	1	5
- Fill Placement	1	1.25	0.25	6	N/A	3
- Pipeline	0.5	1	0.5	6	1	3
Construction Access Points	Existing access road	Calaveras Rd.	Existing Calaveras Rd. access road	Cañada Road & temple parking lot	Cañada Road & reservoir parking lot	Crystal Springs Rd. & WTP road
Haul Routes	I-580 Chrisman Rd. Vernalis Rd.	I-680 Calaveras Rd.	I-680 Calaveras Rd.	I-280 Cañada Rd.	I-280 Cañada Rd.	I-280 Crystal Springs Rd.
Maximum Crew Size	10	10	10	25	8	10
Construction Traffic						
- Total Truckloads[g]	340	425	8	2,849	8	90
- Average Daily Truck Trips[h]	14	23	0	43	0	3
- Peak Daily Truck Trips	42	68	1	128	0	10
- Max. Peak-Hour Truck Trips	4	7	0	13	0	3
- Max. Daily Worker Trips	25	25	25	63	20	25
Construction Hours/Times	7 a.m. to 5 p.m. weekdays	7 a.m. to 5 p.m. weekdays	7 a.m. to 5 p.m. weekdays	7 a.m. to 5 p.m. weekdays	7 a.m. to 5 p.m. weekdays	7 a.m. to 5 p.m. weekdays

TABLE III-2 (Continued)
SUMMARY OF PROJECT CONSTRUCTION SCENARIO AND ACTIVITIES[a]

NOTES: N/A: Not Applicable; ND: Not Determined

a This table includes an estimate of construction-related activities and chemical deliveries for each site. The actual construction-related quantities, durations, and traffic trips would ultimately depend on how the selected contractor decided how to schedule, manage, and perform the work.

b All work in this phase of construction would be done internally to the existing facility. There would be minimal surface disturbance associated with this project (e.g., construction staging area).

c Use of either a contact basin or a 10- to 12-foot-diameter contactor pipe is still under study, and this estimate represents a worst-case scenario. The excavation volume estimate is based on laying the pipe in one large excavation rather than excavating a single trench for each pipe run.

d Assumes one chemical feed line for each chemical [sodium hypochlorite, ammonia, fluoride (future), caustic soda (future)], to each of four treated water pipelines.

e Pipeline alignments subject to change. However, if the Cañada pipeline were selected, new pipeline would involve minimal disruption.

f Construction duration is not the total time allowed for the contractor to complete the entire project, only the time to complete major equipment installation. The total construction duration is not necessarily the sum of estimated durations for each phase of construction (i.e., excavation, concrete placement, fill placement, and large pipeline placement) for each facility. Some heavy construction phases would occur concurrently, while several months could occur between activities. Construction duration estimates do not include the time required to deliver, install, and test other equipment items placed inside structures.

g Total truckloads and traffic volumes assume 20 cubic yards per haul truck and 10 cubic yards per concrete truck and is based on estimated excavation volumes at all sites except the Pulgas site. At the Pulgas site, the number of truckloads and traffic volumes are estimated assuming 50% of the excavated material would be stockpiled or spread over undeveloped field or level areas in the project vicinity and 50% of fill material would be from on-site sources.

h Estimated average daily truck volumes reflect the highest volume that would occur during any single construction phase. At the Tesla and Harry W. Tracy WTP sites, the highest truck volumes would be generated during the excavation phase, whereas at the San Antonio site, the highest volumes would occur during the fill placement phase. At the Pulgas site, the highest volume would occur when the excavation, concrete placement, and fill placement phases overlap.

pipeline trenches would be approximately 5 feet deep and 2 feet wide. Pipeline construction would generally involve: (1) surface preparation; (2) trench excavation; (3) pipe installation; (4) trench backfilling and compacting; and (5) resurfacing with pavement or landscaping.

At the Pulgas site, the proposed contactor pipeline would be 120 inches in diameter, and approximately 1,300 linear feet of the total pipeline length would be required to convey the water from the Pulgas Pump Station to the proposed dechloramination facility and from the dechloramination facility back to the overflow channel. Trench dimensions for the contactor pipeline would be approximately 30 feet wide and 15 to 25 feet deep. Additional area along the pipeline alignment could be required for the staging of supplies and construction equipment and could result in further surface disturbance along the trench.

Table III-2 also presents the estimated range of construction traffic that would occur at each site, based primarily on the estimated quantities of excavated and fill materials. At the Harry W. Tracy WTP site, construction of proposed facilities would generate 3 one-way truck trips on an average day and 10 on a peak day. At the San Antonio Pump Station site, it is estimated that there would be 23 truck trips on an average day and 68 on a peak day. Construction traffic levels at Tesla Portal would be similar to those at San Antonio Pump Station.

At the Pulgas site, the larger amounts of excavated and fill materials (primarily associated with the contactor pipeline) would generate higher levels of truck traffic, ranging from 43 one-way trips on an average day to 128 one-way trips on a peak day. It is anticipated that construction-related traffic would access each of the facility sites via roadways used to access existing facilities in the project vicinities. Table III-2 specifies local and regional access roadways.

Construction activities would occur between 7 a.m. and 5 p.m. on weekdays at all facility sites, and there would be no construction on weekends. However, to avoid potential conflicts with special events and weddings at the Pulgas Water Temple, the SFPUC would not issue permits for weddings at the temple during the construction period. In addition, as part of its standard practices, the SFPUC would notify nearby landowners and land uses in advance of construction activities at each site to inform them of the nature and extent of construction.

H. PROJECT SCHEDULE, IMPLEMENTATION, AND COST

The schedule for implementation of the proposed project is based largely on regulatory requirements specified in the Stage 1 D/DBP Rule. The target date for compliance is December 2001, although the State of California may grant the SFPUC an additional two years to comply if capital improvements are needed. At this time, final design is scheduled to be completed in 2001, and construction completed by early 2003. The last 12 months of the construction period would also include startup activities at new facility sites, initial cleaning of all reservoirs, distribution system flushing, and the formal public outreach program.

Operation of the SFPUC water supply system would require a limited increase in SFPUC staff over existing levels. Additional staff time would be required for operation and maintenance of the new facilities, at the water treatment plant, and for incorporation of chloramination into systemwide operations. Estimated capital costs for the proposed project total approximately $40 million (San Francisco Water Team, 1999a).

I. RELATED PROJECTS AND PLANS

The ~~Draft~~ EIR examines related projects that may result in cumulative considerable environmental effects. Generally, development projects in the vicinity of the project locations would all be within SFPUC-owned lands. The SFPUC Capital Improvement Program (CIP) includes projects that are planned or proposed in the vicinity of one or more of the proposed project locations. These CIP projects are considered because of their proximity to the proposed project locations and because of the potential overlap in construction schedules with that of the proposed project. In addition, the SFPUC has watershed management plans and other SFPUC systemwide projects that may pertain to the planning or design of the proposed project.

These SFPUC projects and plans are distinct from the proposed project due to the separate project objectives and design processes, and are undergoing separate environmental reviews, as determined necessary by the San Francisco Planning Department. In accordance with CEQA, these related projects and plans are considered in this EIR due to the potential for cumulative environmental effects to occur, either during construction or in terms of long-term impacts to

environmental resources at each project location. The related projects and plans, together with the potential cumulative impacts, are described in detail in Section VI.B, Summary of Cumulative Environmental Effects, and are listed below by their project location.

1. Sunol Valley Vicinity
   - Sunol Valley WTP Improvement Project
   - Alameda Creek Fishery Enhancement Project

2. Pulgas Site Vicinity
   - Pulgas Dechlorination Facility
   - Pulgas Balancing Reservoir Improvements
   - Lower Crystal Springs Dam Abutment Protection Project

3. Harry W. Tracy WTP Vicinity
   - Harry W. Tracy WTP Residuals Project
   - Harry W. Tracy WTP Short-Term Improvement Project

4. SFPUC Systemwide
   - Phase 2 System Controls and Data Acquisition (SCADA) Projects

5. City Distribution Division Projects
   - City Distribution Division Improvement Projects

6. Watershed Management Plans
   - Alameda Watershed Management Plan
   - Peninsula Watershed Management Plan

J. REQUIRED PERMITS AND APPROVALS

1.0 FEDERAL AGENCIES

As described below, construction and operation of project facilities require permits and approvals from the U.S. Army Corps of Engineers (Corps) and the U.S. Fish and Wildlife Service (USFWS).

1.1 U.S. ARMY CORPS OF ENGINEERS

Section 404 Permit

Section 404 of the federal Clean Water Act regulates discharge of fill material into "waters of the United States," which include wetlands. Wetlands may occur within the Tesla Portal, San Antonio Pump Station, and Pulgas project sites. The Corps is responsible for issuing permits for projects that propose filling wetlands. It is possible that the project could be permitted under the Corps' Nationwide Permit program, which provides a streamlined process for select project categories, but this would depend on the total acreage of wetlands affected by the project and the status of the allowable categories. Existing Nationwide Permit categories that would likely be applicable to this project include No. 12, Utility Line; No. 18, Minor Discharges; and No. 26,

Headwaters and Isolated Wetland Discharges affecting less than 3 acres. However, the Corps has proposed to phase out use of the current No. 26 permit and replace it with six additional permit categories. The Corps has not completed the necessary review process for the proposed replacement categories. If the project does not qualify for permitting under the Nationwide Permit program (because of the total acreage affected or changes in the program that would exclude the project), then it would be processed as an Individual Permit, which is a more involved process of review.

1.2 U.S. FISH AND WILDLIFE SERVICE

Federal Endangered Species Act (Sections 7 and 10)

The Federal Endangered Species Act (16 United States Code 1531 et seq.) requires formal consultation if a project involving a federal agency will result in the "taking" of a species currently listed as threatened or endangered. Section 9 of the act prohibits the "taking" of listed species. If a federal agency is involved in the permitting of the project (e.g., the Corps could issue a permit for filling wetlands), then the project would be permitted under Section 7 of the Federal Endangered Species Act. If there is no other federal agency involvement, SFPUC could be responsible for consultation with the USFWS regarding issues of "take" under Section 10 of the act. If a listed species could be impacted, a Biological Assessment would need to be prepared and submitted to the USFWS. After review of the Biological Assessment, the USFWS would issue a Biological Opinion, which could allow incidental take of protected species.

Listed species potentially occurring in the project area include California red-legged frog, San Francisco garter snake, Alameda whipsnake, San Joaquin kit fox, California tiger salamander, burrowing owl, salt marsh common yellowthroat, special-status bat species, western leatherwood, Dudley's lousewort, large-flower linanthus, and stink bells. Final facility sites must be reviewed to confirm presence or absence of these species.

Formal consultation with the USFWS and preparation of a mitigation plan to offset loss of sensitive species habitat could be required. The USFWS could require compensatory project mitigation that includes both habitat preservation and habitat creation components. The specific ratios of preserved and created acreage to impacted acreage would be determined during Section 7 consultation, but would most likely be based on the existing USFWS programmatic consultation on 404 permits (USFWS, 1999). The current programmatic consultation requires a preservation acreage ratio of 2:1 and a creation acreage ratio of 1:1 (direct impacts only) for off-site mitigation; or a 3:1 preservation ratio and 2:1 creation ratio (direct impacts only) for on-site mitigation.

2.0 STATE AGENCIES

As described below, construction and operation of proposed project facilities would require permits and approvals from the California Department of Health Services, the California Department of Fish and Game (CDFG), and the Central Valley and San Francisco Bay RWQCBs.

2.1 CALIFORNIA DEPARTMENT OF HEALTH SERVICES

The California Department of Health Services is responsible for inspection and approval of all new facilities for the SFPUC water supply system. All changes to existing facilities and new facilities would need to be included in an amended water supply system permit from the California Department of Health Services. In addition, the California Department of Health Services requires that all kidney dialysis facilities be upgraded to include chloramine removal equipment and be inspected and certified by the California Department of Licensing and Certification prior to systemwide conversion to chloramine, but not more than one year before conversion begins.

2.2 CALIFORNIA DEPARTMENT OF FISH AND GAME (REGIONS 2 AND 3)

Streambed Alteration Agreement (Section 1601)

Under Section 1601 of the California Fish and Game Code, an agency or public utility proposing to substantially divert the natural flow of a stream, substantially alter its bed or banks, or use any material from the streambed, must first enter into a Streambed Alteration Agreement (SAA) with CDFG. An SAA would be required for any construction activity that would occur in a streambed or natural drainage. Construction cannot be initiated on the site until an SAA is executed. The CDFG would only enter into an SAA once all other project permits and certifications have been obtained. The SAA is applied for by submitting a CDFG Streambed Alteration Notification form and a nonrefundable application fee (for projects costing more than $25,000) to the CDFG. The SAA can typically be obtained within a few months, provided proposed mitigation (as developed during the environmental review process) is acceptable to the CDFG. The CDFG, while being able to impose reasonable conditions on the agreement, may not decline to enter into an agreement.

2.3 CENTRAL VALLEY AND SAN FRANCISCO BAY REGIONAL WATER QUALITY CONTROL BOARDS

The Tesla Portal facility is within jurisdiction of the Central Valley RWQCB, while the Alameda, San Mateo, and San Francisco Counties sites are within the jurisdiction of the San Francisco Bay RWQCB.

Water Quality Regulation

The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) regulates water quality within California and established the authority of the State Water Resources Control Board and the nine Regional Water Quality Control Boards. The RWQCB has established regulatory standards and objectives for water quality for local surface water bodies, and is responsible for the implementation and enforcement of the National Pollutant Discharge Elimination System (NPDES) permit program. The NPDES permit specifies discharge prohibitions, effluent limitations, and other provisions (such as monitoring programs) deemed

necessary to protect water quality. All discharges associated with the proposed project would be in compliance with RWQCB requirements.

National Pollution Discharge Elimination System Construction Storm Water Permit

Construction that would disturb over five acres of land requires a State Water Resources Control Board NPDES Construction Storm Water Discharge Permit that would be implemented by the RWQCB. As its name implies, the permit is intended to protect surface water quality from degradation resulting from construction area runoff. To meet the NPDES permit requirements, the State Water Resources Control Board has adopted a statewide General Permit for Storm Water Discharges Associated with Construction Activity; the current 1999 General Permit updates the previous 1992 General Permit.

The Construction Storm Water General Permit requires development and implementation of a Storm Water Pollution Prevention Plan for all discharges where construction activity disturbs five acres or more. This plan must specify best management practices that will prevent all construction pollutants from contacting stormwater, with the intent of keeping all products of erosion from moving off site into receiving waters. The permit also requires elimination or reduction of non-stormwater discharges to receiving waters and implementation of best management practices. In order to obtain coverage under the Construction Stormwater General Permit, landowners are required to file a Notice of Intent prior to starting construction activities and to comply with General Permit conditions.

Although construction activities under five acres are not currently covered by this permit, those activities affecting areas less than five acres will be required to apply for a permit under Phase II regulations by 2003 (State Water Resources Control Board, 1999).

RWQCB 401 Water Quality Certification

The RWQCB can require a project proponent to obtain a Section 401 (Clean Water Act) water quality certification for Section 404 permits granted by the Corps. For wetland impacts that total less than one acre, the RWQCB typically issues a waiver, provided the applicant is also applying to the CDFG for an SAA, as described above. The RWQCB has 60 days to issue this waiver. For wetland impacts of one to two acres, a waiver could also be issued, but only after thorough review of any agency or public comments during the 40-day comment period on the Corps' issue notice (assuming that the Corps has required an individual permit). For more than two acres of wetland removal, the RWQCB requires a mitigation plan, a public hearing, and approval of the water quality certification by the State Water Resources Control Board.

General Order for Dewatering and Other Low-Threat Discharge to Surface Waters Permit

In the event that groundwater is encountered during facility construction that cannot be contained on site or pumped into tank trucks and hauled to a disposal facility, SFPUC would need to apply for a General Order for Dewatering and Other Low Threat Discharges to Surface Water Permit (NPDES #CA0083356) from the Central Valley RWQCB.

3.0 LOCAL AGENCIES

3.1 SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT AND BAY AREA AIR QUALITY MANAGEMENT DISTRICT

The Tesla Portal facility is within jurisdiction of the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD). The Alameda County and San Mateo County sites are within the jurisdiction of the Bay Area Air Quality Management District (BAAQMD).

Authority to Construct and Permit to Operate

Any person or organization proposing to construct, modify, or operate a facility or equipment that may emit pollutants from a stationary source into the atmosphere must first obtain an Authority to Construct and, thereafter, a Permit to Operate from the SJVUAPCD or BAAQMD. These districts issue permits and monitor new and modified sources of air pollution to ensure compliance with national, state, and local emission standards and to ensure that emissions from such sources do not interfere with the attainment and maintenance of ambient air quality standards adopted by the California Air Resources Board and the U.S. Environmental Protection Agency.

REFERENCES – Project Description

San Francisco Water Team, prepared for San Francisco Public Utilities Commission, *Hetch Hetchy Water Treatment Project, Phase 1A Preliminary Engineering Report*, 1996.

San Francisco Water Team, prepared for the San Francisco Public Utilities Commission, *Hetch Hetchy Water Treatment Project Chloramine Conceptual Design Report*, Final Draft, 1999a.

San Francisco Water Team, prepared for the San Francisco Public Utilities Commission, *Hetch Hetchy Water Treatment Project Chloramine Conceptual Design Report*, Appendices, 1999b.

State Water Resources Control Board, National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity (General Permit). Available at www.swrcb.ca.gov/stormwtr, 1999.

U.S. Fish and Wildlife Service (USFWS), Programmatic Formal Endangered Species Act Consultation on Issuance of Permits under Section 404 of the Clean Water Act or Authorizations under the Nationwide Permit Program for Projects that May Affect the California Red-legged Frog. Sacramento Fish and Wildlife Office, Sacramento, CA, January 26, 1999.

CHAPTER IV
ENVIRONMENTAL SETTING AND IMPACTS

This chapter describes the environmental setting and analyzes the potential impacts associated with both short-term construction activities and long-term operation at proposed project locations. As described in Chapter II, this chapter provides the additional detailed analysis of environmental issues that were identified in the Initial Study (see Appendix A). The environmental setting presents both regional context and site-specific details of the existing conditions to provide a basis for identifying potential impacts due to project implementation. This chapter also includes, for each environmental issue, a description of significance criteria used in analyzing potential impacts. Based on these criteria, impacts determined to be significant or potentially significant require mitigation measures to reduce them. The impact analysis indicates whether or not mitigation measures are available to reduce impacts to a less than significant level, and the reader is referred to Chapter V for detailed description of mitigation measures. In some cases, where impacts are determined to be less than significant, the impact analysis recommends improvement measures that could reduce adverse effects or temporary disruption but are not required under the California Environmental Quality Act (CEQA).

A. PLANS AND POLICIES

1.0 REGIONAL SETTING

The City and County of San Francisco, as a chartered city and county, and the San Francisco Public Utilities Commission (SFPUC), as a public utility, receive intergovernmental immunity under California Government Code Sections 53090 et seq. Such immunity exempts the extraterritorial lands owned by the City and County of San Francisco, through its SFPUC, from the planning and building laws of any other city or county in which those lands are located. Thus, the zoning and building codes, general plans, specific plans, and other planning and building policies of San Joaquin County, Alameda County, and San Mateo County, or various regional plans, do not apply to this project. Under Government Code Section 65402(b), the counties are entitled to review and determine the consistency of a project on extraterritorial lands with the applicable general plan prior to construction of any structures contemplated under the project, although the counties' determinations are not binding on San Francisco. Development of non-SFPUC property surrounding the project sites, however, would be subject to the planning and building laws of the local jurisdiction. In addition, the SFPUC has authority over the management, use, and control of its extraterritorial lands under the San Francisco City Charter, Section 4.112. San Francisco's planning and building laws, to the extent that they apply to San Francisco's extraterritorial lands, could be applicable to the project sites, as long as they do not conflict with the SFPUC's charter responsibilities. Similarly, the *San Francisco General*

Plan applies primarily to lands within the City and County of San Francisco, and there are no specific policies directed to areas outside of these boundaries, although general environmental resource policies in the general plan could be applicable to the project sites.

The SFPUC seeks to manage its lands in a way that is consistent with San Francisco's planning and building laws and works cooperatively with local jurisdictions to avoid conflicts with local planning and building laws. Nevertheless, the laws of other jurisdictions are nonbinding on the SFPUC's management of its lands. The referenced excerpts from the general plans of San Joaquin County, Alameda County, and San Mateo County, and various regional plans, are presented in this report for informational purposes only.

The Pulgas site lies within the Central California Coast International Biosphere Reserve, a designation made by the United Nations to acknowledge the high ecological value and unique natural resources of the area. However, this designation does not carry any oversight or legal authority.

1.1 TESLA PORTAL SITE

The Tesla Portal site falls within the planning area of the *San Joaquin County General Plan 2010* (1992).

San Joaquin County General Plan 2010

The *San Joaquin County General Plan 2010* was adopted in July 1992. It establishes land uses, plans, and policies for all unincorporated areas in the County. The plans and policies of the general plan are summarized below and are presented for informational purposes only.

Project Site

The area in which Tesla Portal is located is designated General Agriculture. According to land use designations contained in the general plan's "Key Plan Strategies," General Agriculture refers to "areas generally committed to agriculture with viable commercial agricultural enterprises that require large land areas to efficiently produce their crops." As opposed to lands designated Agriculture/Urban Reserve, General Agriculture lands are protected so that they will remain in agriculture.

The subchapter on Agricultural Lands lists 11 policies. Policy 2 explains the General Agriculture land use designation:

- Function. The General Agriculture land use designation will be considered in areas suitable for agriculture outside areas planned for urban development....
- Density. Development density shall be a maximum of one primary dwelling unit per 20 gross acres....The designation of appropriate parcel sizes shall be based on the predominant existing parcel size and residential density in the area.
- Typical Uses. Typical uses include crop production, feed and grain storage and sales, aerial crop spraying, and animal raising and sales. Additional activities such as resources

recovery, dairy and canning operations, stockyards, and animal feedlots and sale yards require permits.

Policy 5 deals with the compatibility of nonfarm uses located on agricultural lands. Such uses must satisfy four criteria:

- The use requires a location in an agricultural area because of unusual site area requirements, operational characteristics, resource orientation, or because it is providing a service to the surrounding agricultural area;
- The operational characteristics of the use will not have a detrimental impact on the management or use of surrounding agricultural properties;
- The use will be sited to minimize any disruption to the surrounding agricultural operations; and
- The use will not significantly impact transportation facilities, increase air pollution, or increase fuel consumption.

Policy 7 states that, "There shall be no further fragmentation of land designated for agricultural use, except in the following cases:...A parcel may be created for a use granted by permit in the A-G zone, provided that conflicts with surrounding agricultural operations are mitigated."

Surrounding Land Uses

Within a one-mile radius of the site, the only area not designated General Agriculture is Chrisman, which is designated as a Rural Residential area. Rural Residential areas are "large lot (1-5 acres) residential development where full urban services are not available or expected." Chrisman is considered part of the Tracy planning area. According to Subchapter D, the *San Joaquin General Plan* assumes that, "No further development will occur in Chrisman, with the exception of the Hillside Greens subdivision, which will build out as planned."

Scenic Routes

Scenic routes through San Joaquin County are depicted in the general plan. Interstate 580 (I-580), which runs near the Tesla Portal site, has been so designated because it has agricultural/rural value, interesting topography, and connects with other scenic routes. Policy 13 under the heading "Open Space" states that, "Development proposals along scenic routes shall not detract from the visual and recreational experience."

County Zoning Ordinance

Zoning for the Tesla Portal site is AG-160, which designates General Agriculture lands in parcels of at least 160 acres. Typical permitted uses on AG-zoned lots include agricultural processing and sales, animal raising and specialty services, crop production, farm machinery uses, produce sales, parks and campgrounds, and utility services.

1.2 SAN ANTONIO PUMP STATION SITE

The San Antonio Pump Station site is located within unincorporated Alameda County. It lies within the planning areas of the *Alameda County General Plan* and the *East Bay Regional Park District Master Plan* (1996), and is in an Alquist-Priolo Special Study Zone.

East County Area Plan

Alameda County divides its general plan into geographic units; the San Antonio Pump Station site is included in the *East County Area Plan* (ECAP). The ECAP, adopted in May 1994, includes the cities of Dublin, Pleasanton, Livermore, and small portions of Hayward. Plans and policies of the ECAP are summarized below and are presented for informational purposes only.

Project Site

The area surrounding the San Antonio Pump Station site has a land use designation of Water Management. The ECAP defines the category in the following way: "This designation provides for active sand and gravel quarries, reclaimed quarry lakes, watershed lands, arroyos, and similar compatible uses."

Under the subheading "Watershed," the ECAP goal is to, "Protect watershed land from the direct and indirect effects of development." The ECAP lists four policies under this subheading, as follows:

- 102. The County shall encourage public water management agencies to explore recreational opportunities on watershed lands...where recreational use would not conflict with watershed protection objectives.

- 103. The County shall encourage the San Francisco Water Department[1] to provide limited public access on trail corridors through the watershed lands surrounding San Antonio and Calaveras Reservoirs, [and] Sunol Watershed....The County shall work with the East Bay Regional Park District to incorporate these watershed corridors into the regional trail system, where recreational use would not conflict with watershed protection objectives.

- 104. The County shall designate an area outside of the San Francisco Water Department lands that extends to the limit of the watershed boundary as "Resource Management." Within this area, the County shall encourage land use activities to adhere to management guidelines developed for the protection of watershed lands and shall ensure that subdivisions of lands or quarry operations and reclamation places within this designation are approved only where such subdivisions or quarry operations would not adversely affect the watershed protection objectives of the San Francisco Water Department.

- 105. The County shall preserve the area located between the Sunol/Ohlone Wilderness and San Francisco's San Antonio and Calaveras Reservoir watershed lands for uses compatible with watershed and recreational lands.

[1] The San Francisco Water Department is now the Water Supply and Treatment Division of the SFPUC.

Surrounding Land Use

Within a one-mile radius of the San Antonio Pump Station site, some land is designated as Resource Management. The ECAP defines this category in the following way: "This designation provides for agricultural uses, recreational uses, habitat protection, watershed management, public and quasipublic uses, areas typically unsuitable for human occupation due to public health and safety hazards such as earthquake faults, floodways, unstable soils, or areas containing wildlife habitat and other environmentally sensitive features, secondary residential units, active sand and gravel and other quarries, reclaimed quarry lakes, and similar and compatible uses....This designation is intended mainly for land designated for long-term preservation as open space but may include low intensity agriculture, grazing, and very low density residential use."

Implementation Program 47 under the subheading "Watershed" states that, "The County shall develop management guidelines for lands designated 'Resource Management' for the purpose of protecting watershed lands from potential degradation resulting from incompatible uses."

Recreation

Policy 74 under "General Open Spaces" indicates that the County shall work with the East Bay Regional Park District, the Livermore Area Recreation and Park District, and other relevant agencies to ensure that open space trails adjacent to San Joaquin, Contra Costa, and Santa Clara Counties connect with trail systems in these other counties.

There are six implementation strategies listed under the general open space and specific open space policies. Implementation Program 26 states that, "The County shall work with the East Bay Regional Park District, the Livermore Area Recreation and Park District, the San Francisco Water Department, California Department of Fish and Game, and cities to identify appropriate public and private uses that should be allowed within various portions of the open spaces system, including active and passive recreation, and grazing."

County Zoning Ordinance

The San Antonio Pump Station parcel is zoned A, Agricultural. Typical permitted uses for agricultural zoning include farms and nurseries, raising animals or fish, hiking or riding trails, and limited residential use. Conditional and accessory uses include outdoor recreation facilities or their administrative support, wind-electric generators, and farm and maintenance buildings.

East Bay Regional Park District Master Plan

The East Bay Regional Park District, which has jurisdiction over regional parks in Alameda and Contra Costa Counties, adopted its most recent master plan in 1997. The master plan calls for expansion of its regional trail system, preservation of natural and cultural resources within its parks, and protection of open space. See Section IV.B, Land Use and Recreation, for a more detailed discussion.

Alquist-Priolo Special Study Zone

The San Antonio Pump Station site is within an Alquist-Priolo Special Study Zone. This designation was made in 1972 by the California Department of Conservation, Division of Mines and Geology because the area is considered vulnerable to seismic activity. Development within this area is subject to more rigorous permitting and review; see Section IV.H, Geologic Resources, for further information.

1.3 PULGAS SITE

The Pulgas site is located in San Mateo County and lies within the planning area of the County's general plan. It is within the boundaries of the Scenic Easement, and the Pulgas Balancing Reservoir site is within the boundaries of the Scenic and Recreation Easement, both administered by the Golden Gate National Recreation Area.

San Mateo County General Plan

The *San Mateo County General Plan* was adopted in November 1986. Plans and policies of the general plan are summarized below and are presented for informational purposes only.

Project Site

County land use is divided into urban and rural, with the Pulgas site designated Rural Lands / General Open Space. Subchapter 9.4 of the *San Mateo County General Plan* contains the following land use objectives for rural lands:

- Protect and conserve vegetation, water, fish and wildlife resources, productive soil resources for agriculture and forestry, and other resources vital to the sustenance of the local economy;
- Carefully manage and enhance the use, production, conservation or extraction of soils, timber, minerals and other natural resources;
- Protect and enhance the unique scenic quality and pastoral character of the rural lands;
- Provide a diversity of outdoor recreational opportunities for existing and future County residents;
- Protect the public health and safety by minimizing the location of new development in potentially hazardous areas and directing infrastructure improvements to areas that will benefit the greatest number of rural residents and visitors;
- Minimize the amount of environmental damage caused by construction of major and minor roads or other infrastructure improvements; and
- Promote local employment opportunities and enhance creative enterprise by encouraging visitor-serving facilities, ancillary and accessory uses vital to resource production operations, and adaptive reuse of surrounding resources.

There are several general open space policies pertinent to the project. Under Section 9.42, Development Standards for Land Use Compatibility, one policy states, "Locate development in areas of parcels which cause the least disturbance to scenic resources and best retain the open space character of the parcel." Policy 9.43, San Francisco Watershed Lands, states, "Recognize the San Francisco watershed lands as unique areas of special open space significance that should be protected from conflicting land uses in order to retain their value as open space, wildlife, water supply, and recreational resources."

Recreation

Because the site provides for public recreational access, recreation policies of the *San Mateo County General Plan* are relevant to the project. Several policies in Chapter 6, Park and Recreation Resources, are applicable:

Policy 6.5, Access to Park and Recreation Facilities:

- Attempt to provide appropriate access and conveniences for all people in park and recreation facilities.
- Encourage access to the park and recreation system by transportation means other than private automobiles, where feasible.

Policy 6.18, Regulation of Encroachment:

- Regulate the encroachment into park and recreation facilities by nonpark uses. When encroachment is deemed necessary, minimize adverse impacts by considering the following measures: (a) use the Creative Road Design Guide where appropriate to minimize environmental effects when improving roadways or building new ones in or through park and recreation resources.

Policy 9.36, Development Standards to Minimize Land Use Conflicts in Public Recreation Lands:

- Provide structural, visual, auditory and other buffering mechanisms to protect portions of the public recreation lands that are used by the public from nonrecreational uses.

Surrounding Land Use

All unincorporated land within one mile of the site is designated Rural Land / General Open Space.

County Zoning Ordinance

The Pulgas site is zoned Resource Management. Typical permitted uses include agricultural uses, timber harvesting and quarries, residential, public/commercial recreation, and scientific/technical research. All development within areas zoned Resource Management requires a permit, with some exceptions (mostly resource related).

Section 6324.2, Site Design Criteria, contains review criteria for development within Resource Management areas:

(a) Development shall be located, sited, and designed to carefully fit its environment so that its presence is subordinate to the pre-existing character of the site…

(b) All roads, buildings, and other structural improvements or land coverage shall be located, sited, and designed to fit the natural topography…

(h) The development shall employ colors and materials which blend in with, rather than contrast with, the surrounding soil and vegetative cover of the site…

(i) Wherever possible, vegetation removed during construction shall be replaced….

(j) Removal of living trees with trunk circumference of more than 55 inches measured 4 ½ feet above the average surface of the ground is prohibited, except as may be required for development…

In addition, I-280 is a designated Scenic Corridor. Section 6325.1, Primary Scenic Resources Areas Criteria, addresses areas visible from scenic corridors:

(a) Public views within and from scenic corridors shall be protected and enhanced, and development shall not be allowed to significantly obscure, detract from, or negatively affect the quality of these views….Development visible from Scenic Corridors shall be so located and designed as to minimize interference with ridgeline silhouettes.

(e) Curved approaches to Scenic Corridors shall be used in conjunction with native planting to screen access roads from view….

(f) The number of access roads to a Scenic Corridor shall be minimized wherever possible….

(n) Screening as required under this section should not consist of solid fencing, rather it should be of natural materials of the area….

U.S. Department of Interior, Golden Gate National Recreation Area – Scenic Easement and Scenic and Recreation Easement

In 1969, the City of San Francisco granted two easements over the vast majority of the Peninsula Watershed to the Department of the Interior. The easements were granted to the federal government in order to obtain a change in the route of I-280 (and resulting increased federal share of costs) to a less environmentally damaging location further east of Crystal Springs Reservoir. The approximately 19,000-acre scenic easement covers the lands west of Crystal Springs and San Andreas Reservoirs. The approximately 4,000-acre Scenic and Recreation Easement applies to lands in the vicinity of I-280. In the project area, Cañada Road demarcates these easements: the Pulgas site is within the Scenic Easement, while the Pulgas Balancing Reservoir is within the Scenic and Recreation Easement. The easements cover nearly all of the SFPUC-owned Peninsula Watershed lands and place restrictive covenants on use of the land which are unrelated to the SFPUC's overall management of the land for utility purposes.

In 1980, Congress transferred responsibility for administration of the easements to the National Park Service–Golden Gate National Recreation Area. The legislation provides that the terms of the easements are to be administered by the National Park Service. The Peninsula Watershed is

- not part of a national park or recreation area per se, as the SFPUC retains ownership of the land and the National Park Service has only a limited interest. The City is not bound by National Park Service planning mandates or procedures that Golden Gate National Recreation Area must follow. Certain activities unrelated to water supply and utility operations may require "concurrence" of the U.S. Department of the Interior. However, the proposed Pulgas Dechloramination Facility would be a water utility structure, and its construction is an exercise of the City's reserved rights under the terms of both easements. Therefore, no concurrence on the part of the GGNRA is required.

1.4 HARRY W. TRACY WATER TREATMENT PLANT SITE

The Harry W. Tracy Water Treatment Plant (WTP) is located in unincorporated San Mateo County, on land between the cities of San Bruno and Millbrae. However, the site is not located within the sphere of influence of either of these cities. The site lies within the *San Mateo County General Plan* area.

San Mateo County General Plan

- The plans and policies of the *San Mateo County General Plan* are summarized below and are provided for information purposes only.

Project Site

The County's general plan does not include a land use designation for the Harry W. Tracy WTP.

Surrounding Land Use

Rural Lands / General Open Space. All unincorporated land west of I-280 and within one mile of the site is designated Rural Land / General Open Space. For a discussion of San Mateo County policies regarding this land use designation, see Section 1.3, Pulgas Site, above.

County Zoning Ordinance

The Harry W. Tracy WTP site is zoned Resource Management. Typical permitted uses include agricultural uses, timber harvesting and quarries, residential, public/commercial recreation, and scientific/technical research. All development within areas zoned Resource Management requires a permit, with some exceptions (mostly resource related).

There are further development criteria for sites located within Resource Management areas, which are discussed in Section 1.3, Pulgas Site, above.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for plans and policies impacts, but it generally considers that implementation of the proposed project would have a significant plan or policy impact if it were to:

- substantially conflict with established local, regional, state, or federal plans, policies, and/or guidelines, and as a consequence of such conflict, could potentially result in an adverse physical impact on the environment.

2.2 IMPACTS

Potential conflict of the proposed project with the plans and policies of jurisdictions other than the SFPUC is a policy issue and would not be considered a physical environmental impact of the proposed project. As stated above, local planning and building laws are not applicable to the extraterritorial lands owned by the City and County of San Francisco. In general, potential conflicts of a proposed project or program on extraterritorial lands with the planning laws of other jurisdictions are considered by the decision-makers independently of the environmental review process as a part of the decision to approve, modify, or disapprove a proposed project or program. The EIR analyzes and provides information on the potential environmental impacts of implementing the proposed project. The information on planning laws of local jurisdictions could be used by the SFPUC and other decision-makers in assessing the extent to which the proposed project may conflict with such laws and in making the decision to approve the proposed project or an alternative. There are no substantial conflicts with any of the plans and policies described in this section, given that the project would expand existing water service facilities within the boundaries of SFPUC-owned lands recognized to be used for such purposes. The significant environmental effects of the project, described in the following sections of this chapter, could be mitigated to a less than significant level.

REFERENCES – Plans and Policies

County of Alameda, *Draft Environmental Impact Report for the East County Area Plan*, 1993.

County of Alameda, *East County Area Plan*, 1994.

County of San Joaquin, *San Joaquin County General Plan 2010*, 1992.

County of San Mateo, *San Mateo County General Plan*, 1986.

County of San Mateo, Planning Division, 1978.

East Bay Regional Park District, *Master Plan 1997*, 1996.

B. LAND USE AND RECREATION

The Initial Study for this project evaluated the potential land use and recreation impacts associated with construction and operation of project-related facilities (see Appendix A). The Initial Study determined that proposed facilities would intensify existing water facility operations and increase the extent of developed area at facility locations. Therefore, this section evaluates potential short- and long-term impacts on the land use character in the vicinities of the facility locations. The Initial Study also identified potential impacts on recreational uses at the San Antonio Pump Station site and Pulgas site. Therefore, this section also evaluates potential impacts on recreational uses at these two locations.

1.0 REGIONAL SETTING

All four sites are located on lands owned by the SFPUC. This section describes existing land uses at each site, as well as land use and recreational uses in surrounding areas.

1.1 TESLA PORTAL SITE

Land Use

The Tesla Portal site is located in unincorporated southwestern San Joaquin County. The site lies along the Hetch Hetchy Aqueduct approximately one mile east of the I-580 / State Route 132 interchange. The site is roughly 7-1/2 miles south of the city of Tracy. Figure IV.B-1 shows the Tesla Portal project site and surrounding land uses.

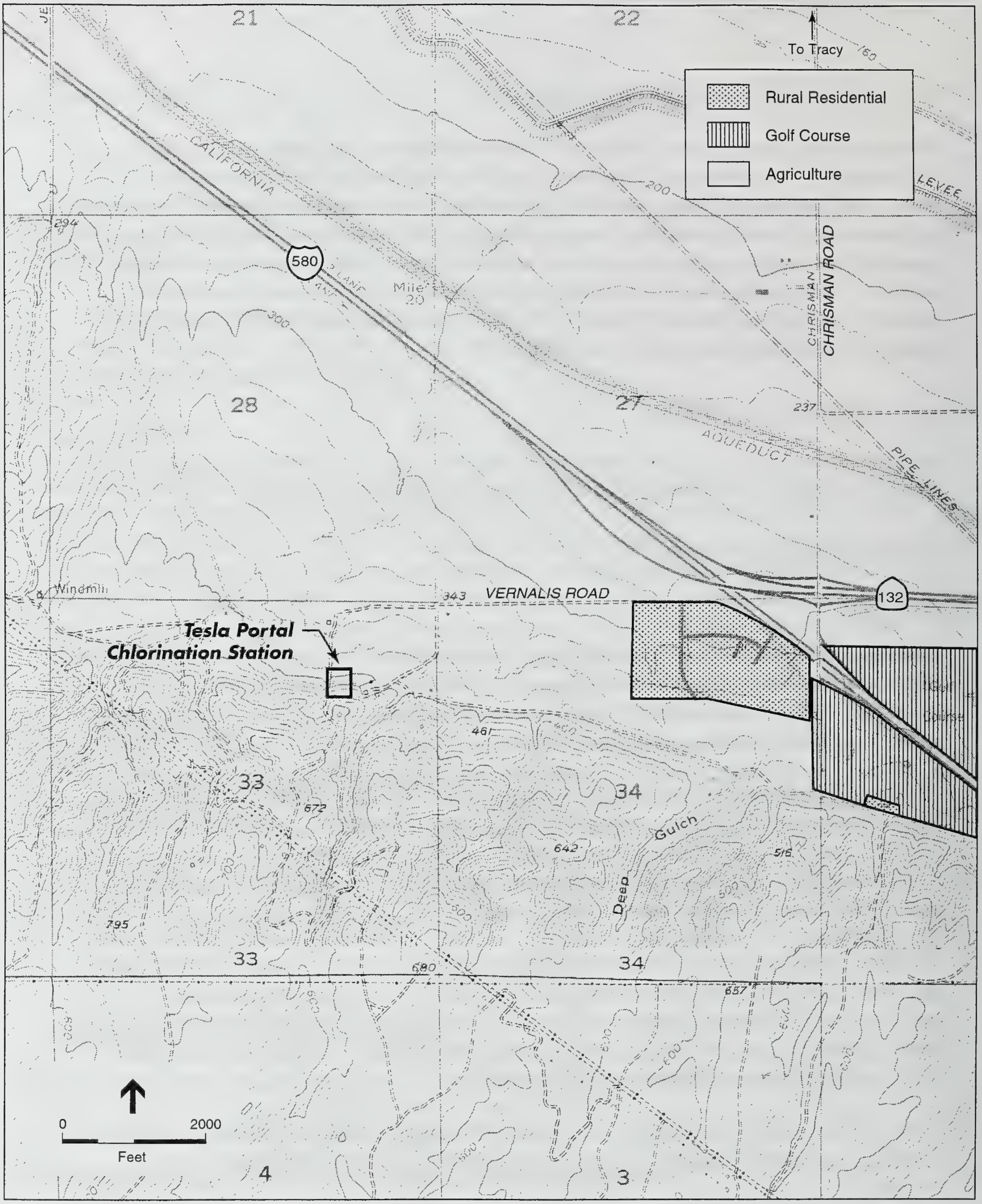
The site is approximately seven acres and contains seven buildings. Three of the buildings are associated with a residential use: a single-family house that is currently occupied by a SFPUC employee, which has an associated garage and shed. One building (approximately 10 feet by 35 feet) serves as an office, and one building (approximately 25 feet by 50 feet) houses storage tanks. Two smaller structures serve as outbuildings.

The areas immediately north, west, and south of the site are occupied by large-scale cattle ranch operations. Roughly 1/2 mile to the east lies Chrisman, a 233-acre unincorporated rural residential area. Chrisman contains a 150-acre, 18-hole golf course and 66 acres of residential land. At the time of the 1992 *San Joaquin County General Plan 2010*, Chrisman contained 50 houses (mostly on one-acre lots) and 150 residents.

I-580 runs in a northwest/southeast direction about 3/4 miles from the site. West of I-580 lies the California Aqueduct. This aqueduct runs roughly parallel to I-580, at a distance of roughly 1/2 mile.

Recreation

The only recreational facility within a one-mile radius of the site is the Tracy Golf & Country Club. This private golf course is approximately one mile east of Tesla Portal in Chrisman. The



SOURCE: USGS; Pittman & Hames Associates, 2000; and San Joaquin County General Plan, 2010, 1992

1998.898E: Hetch Hetchy Water Treatment Chloramine Conversion Project EIR / 990095

Figure IV.B-1
Tesla Portal Site Land Use

Tesla Portal site is not near any other recreational resources, as identified in the County's general plan. The nearest area so designated, the Stanislaus River, is roughly four to five miles northeast of the site. The Carnegie State Vehicular Recreation Area is approximately three miles west of the site.

1.2 SAN ANTONIO PUMP STATION SITE

The San Antonio Pump Station site is located in unincorporated lands in eastern Alameda County, in Sunol Valley. The site lies along the Hetch Hetchy Aqueduct just west of Calaveras Road, roughly two miles south of the interchange between I-680 and State Route 84. The site is approximately three miles east of the city of Fremont.

Land Use

The roughly three-acre site contains one large building (approximately 20 feet by 70 feet) that contains storage tanks, two small outbuildings, and a generator. The site lies within and is entirely surrounded by watershed lands owned by the SFPUC. Along the west side of Calaveras Road are a number of wholesale plant nurseries, the closest of which is less than 500 feet south of the site. Gravel operations north of the site are on a long-term ground lease on land owned by the SFPUC. The east side of Calaveras Road is undeveloped. The Sunol Valley WTP, another SFPUC facility, also lies on the west side of Calaveras Road, roughly 1/2 mile south of the site. Figure IV.B-2 shows the San Antonio Pump Station site and surrounding land uses.

Approximately one mile to the northeast lies the San Antonio Reservoir. The unincorporated town of Sunol is located about three miles northwest of the site. Sunol is a prewar railroad town, currently occupied by single-family residential units, some small-scale retail uses (restaurant, antique shop), and an elementary school. The entrance to the Sunol Water Temple, another SFPUC facility, is approximately 2-1/2 miles northeast of the site.

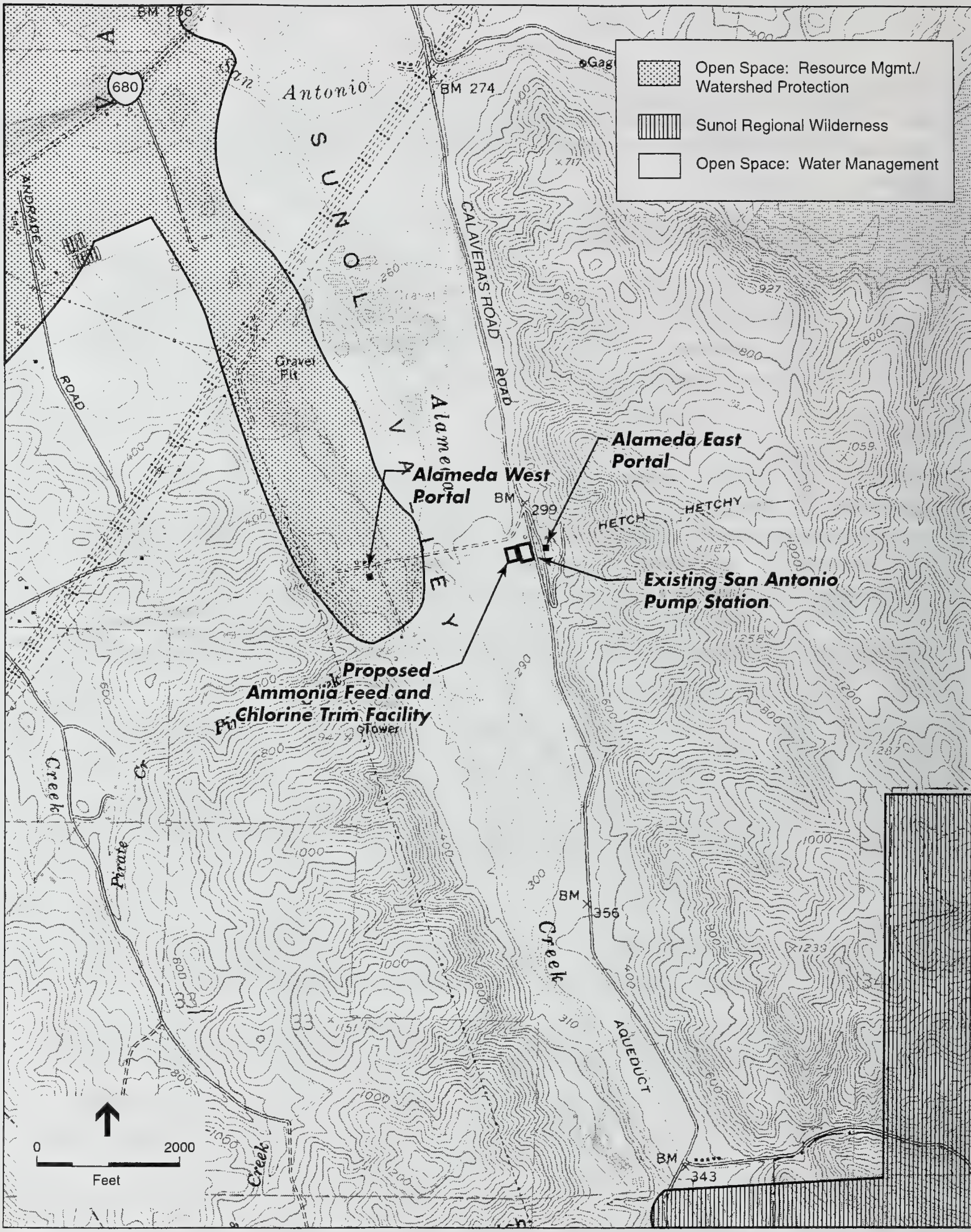
Recreation

The Sunol Valley Golf Course is located approximately 1-3/4 miles northwest of the site. The Sunol Regional Wilderness Area lies roughly 1-1/2 miles south along Calaveras Road.

The East Bay Regional Park District (EBRPD) *Master Plan 1997* indicates a proposed regional trail to be located roughly parallel to, and no more than one mile to the west of, Calaveras Road. According to EBRPD staff, however, an alignment for this trail has not yet been selected, so there are no immediate plans to begin construction.

1.3 PULGAS SITE

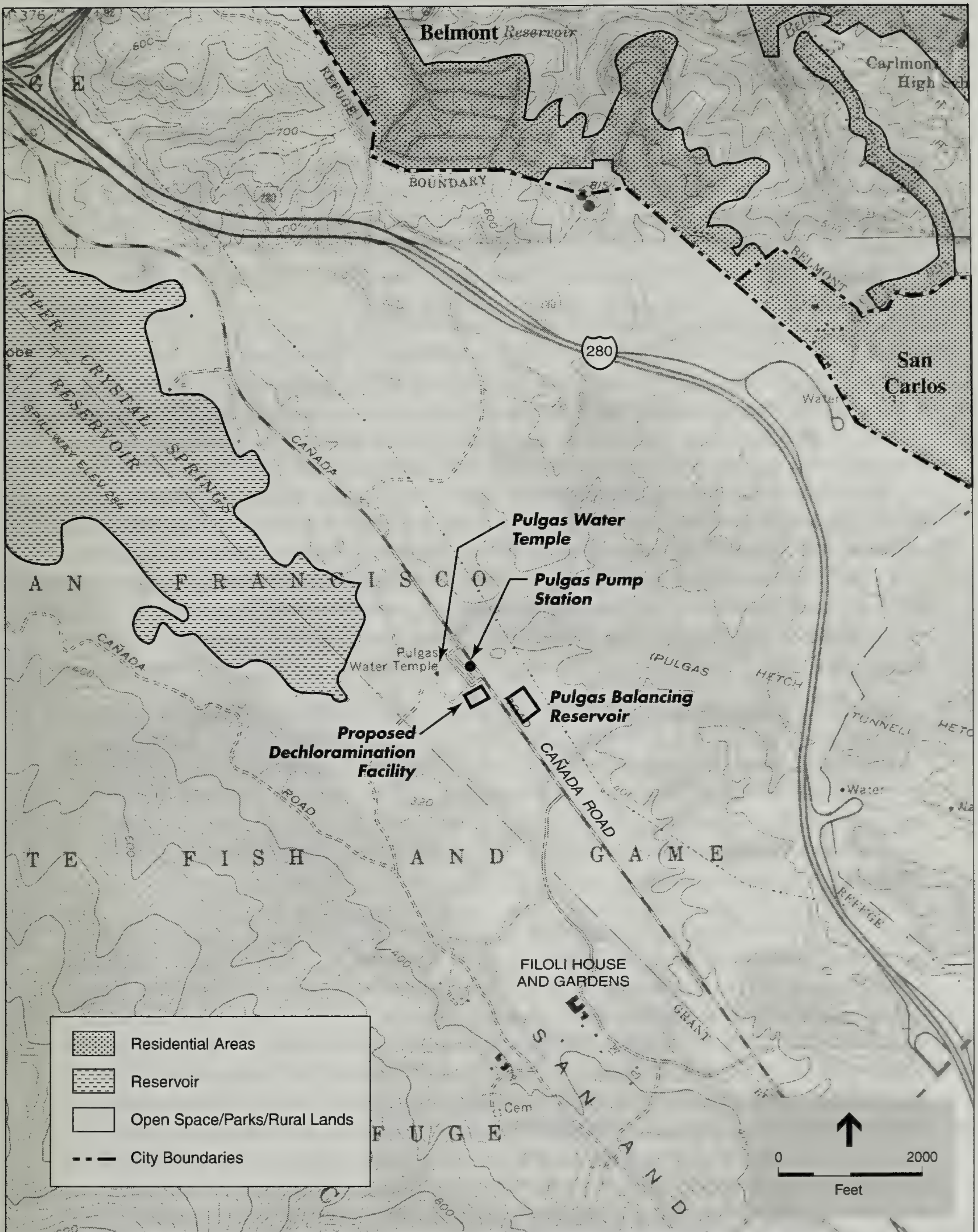
The Pulgas site is within unincorporated San Mateo County and lies to the immediate west of Cañada Road, approximately 2-1/2 miles south of the junction of I-280 and State Route 92. The nearest cities are San Carlos and Belmont, roughly 1-1/4 and 1-1/2 miles northeast of the site, respectively. Figure IV.B-3 shows the Pulgas site and surrounding land uses.



1998.898E: Hetch Hetchy Water Treatment Chloramine Conversion Project EIR / 990095

SOURCE: USGS; Pittman & Hames Associates, 2000; and East County Area Plan, Open Space Diagram, 1994

Figure IV.B-2
Sunol Valley Land Use



SOURCE: USGS; Pittman & Hames Associates, 2000; San Mateo County General Plan, Rural Land Use Map, 1986; Belmont Zoning Map, and San Carlos Zoning Map

1998.898E: Hetch Hetchy Water Treatment Chloramine Conversion Project EIR / 990095

Figure IV.B-3
Pulgas Site Vicinity Land Use

Land Use

The roughly seven-acre site contains several sheds and one building, the Pulgas Water Temple, a stately open-air, columned structure fronted by a reflecting pool, and shallow stone steps. The temple is registered on the *California Inventory of Historic Resources*. (Refer also to Section IV.G, Cultural Resources.) Public parking includes one surface lot striped for 27 spaces, and an unstriped overflow lot that could accommodate 25 to 30 spaces. The remainder of the site is green open space with walking trails. Portable public restrooms are also available at the site.

The Pulgas site is located within a larger area of watershed lands owned by the SFPUC. The temple is also within the San Francisco State Fish and Game Refuge, a state designation that prohibits hunting within the protected area. The site is roughly 1/2 mile southeast of the Upper Crystal Springs Reservoir. I-280 (the Junipero Serra Freeway) runs northwest/southeast through the refuge, forming an arc about one mile east of the site. Beyond the highway, about 1-1/4 miles east of the site, lies the western boundaries of the cities of Belmont and San Carlos. In the vicinity of the site, land uses in both of these cities are single-family residential and open space. There is also a scenic overlook point off I-280 near the San Carlos border. About one mile to the southeast is the Pulgas Ridge Open Space, which is administered by the Midpeninsula Regional Open Space District. Approximately one mile south along Cañada Road is the entrance for the Filoli House and Gardens, a National Trust for Historic Preservation site.

Recreation

The Pulgas Water Temple, a unique parklike setting, is open to the public. The automobile gates are open weekdays from 9 a.m. to 4 p.m., but persons on foot or bicycle may access the temple outside of these hours. Parking is prohibited along Cañada Road, and the site is closed entirely to the public from 10 p.m. to 5 a.m. daily. Two-hour permits are granted for weddings between April and October. A maximum of two permits per Saturday are issued. During the summer months, there are often two weddings per day at the water temple. Permits are not available on Sundays.

The Golden Gate National Recreational Area (GGNRA) administers a Scenic Easement and a Scenic and Recreation Easement that cover nearly all of the SFPUC-owned Peninsula Watershed lands and place restrictive covenants on uses of the land which are unrelated to the SFPUC's overall management of the land for utility purposes. In the project area, the Scenic Easement includes the lands west of Cañada Road, while the Scenic and Recreation Easement includes land to the east of Cañada Road (see Section IV.A, Plans and Policies). The City is not bound by National Park Service planning mandates or procedures that Golden Gate National Recreation Area must follow. Certain activities unrelated to water supply and utility operations, such as those resulting in topographic changes, major excavation, and tree cutting, and the design and location of buildings that are not water-utility-related, may require "concurrence" of the U.S. Department of the Interior. However, the easement provides the SFPUC with the right to construct, maintain, repair, expand, and to reconstruct and make changes to the area for uses that are directly related to water-utility facilities and operations without federal concurrence (Hornor, 2000). The proposed Pulgas Dechloramination Facility would be a water utility structure, and its

construction is an exercise of the City's reserved rights under the terms of both easements. Therefore, no concurrence on the part of the federal government is required.

The SFPUC watershed lands contain walking trails open to the public as well as trails available only through SFPUC-issued permits. The SFPUC issues fewer than 100 permits yearly to individual equestrians. In addition, group permits can be issued to chartered groups that have proof of liability coverage. An average of 75 people per month use the permit-only trails, with higher usage during the summer months (Naras, 1999). Several alternatives to these arrangements are discussed in the *Draft Peninsula Watershed Management Plan* (SFPUC, 1998), but the plan has not yet been adopted.

The Filoli Estate House and Gardens, located one mile south of the Pulgas Water Temple, is a 1910s country estate owned by the National Trust for Historic Preservation. It is open to the public from mid-February until the end of October, Tuesdays through Saturdays.

The San Mateo County Parks Department sponsors an event called Bike Sunday, which takes place year-round every Sunday between 9 a.m. and 4 p.m. During those times, Cañada Road (on which the Pulgas site is located) is closed to vehicular traffic, except SFPUC maintenance trucks, between State Route 92 and Edgewood Road, a distance of approximately four miles. On a typical August Sunday, the bike event attracts nearly 1,000 participants (425 bicyclists, 300 rollerbladers, and 250 runners/pedestrians). The number is roughly half that during the winter months.

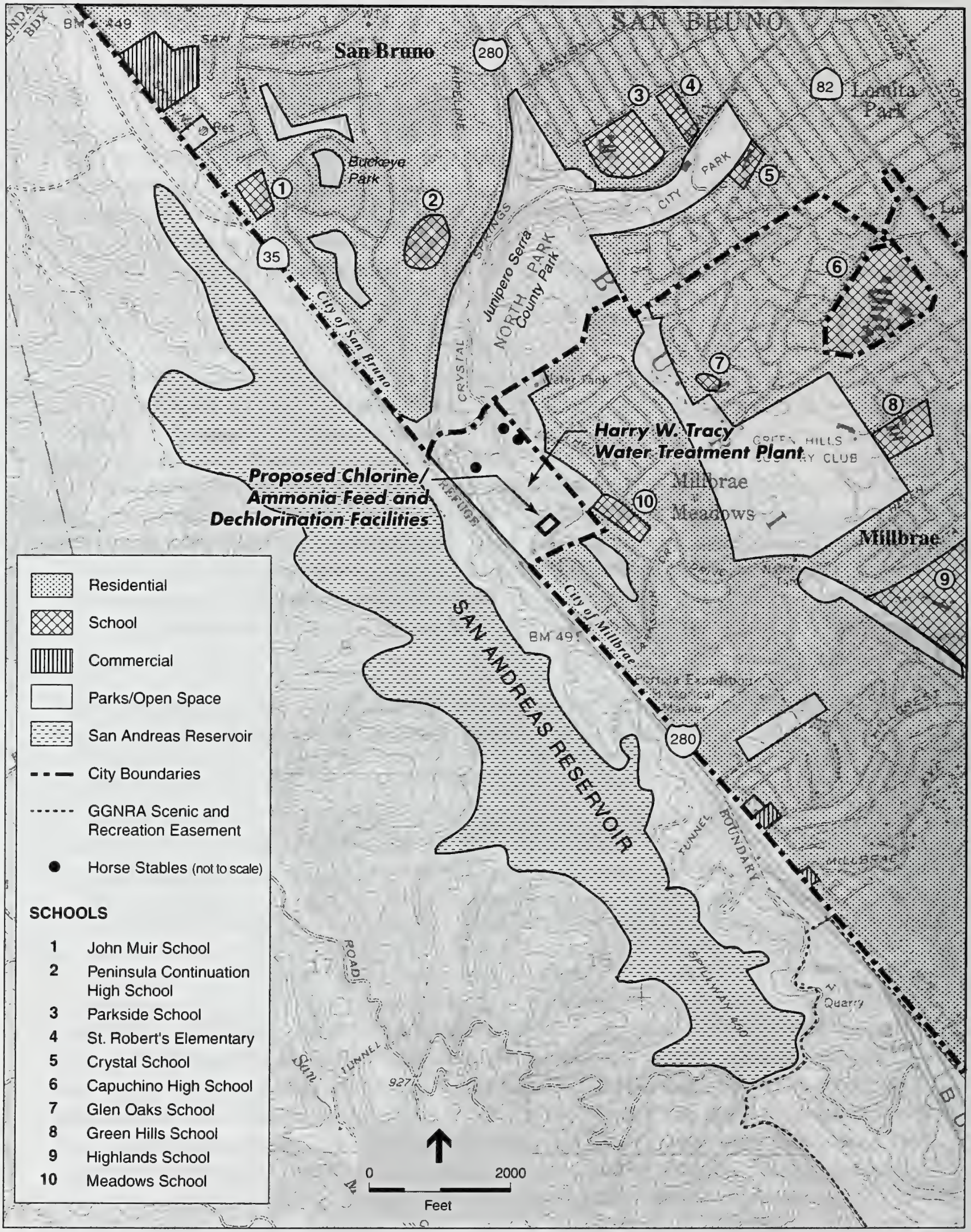
An annual bicycle race, the Chronicle Tour de Peninsula, takes place along Cañada Road in early August. In August 1999, this event attracted 3,500 cyclists and 650 rollerbladers and pedestrians (Trejo, 1999).

1.4 HARRY W. TRACY WATER TREATMENT PLANT SITE

The Harry W. Tracy WTP site is located between San Bruno and Millbrae in San Mateo County. The site is just east of I-280 (Junipero Serra Freeway), southeast of the I-280 / State Route 35 (Skyline Boulevard) interchange.

Land Use

The approximately 40-acre Harry W. Tracy WTP site is accessible from an entrance road along Crystal Springs Road. The main area of the site contains a one-story, 11,000-square-foot administration building, sedimentation basins (long, uncovered troughs), smaller buildings containing storage tanks, and large (approximately 25 feet high) uncovered tanks. There are other developed areas and structures within the site, including tanks, reservoirs, pumps, and a generator. In addition to SFPUC structures, an equestrian group leases part of the land from the SFPUC to house 15 to 20 horse stables, located on undeveloped portions of the site.
Figure IV.B-4 shows the Harry W. Tracy WTP project site and surrounding land uses. I-280 runs northwest/southeast along the site. Directly southwest of I-280 lies San Andreas Reservoir, which is located within SFPUC watershed lands. Further west, beginning roughly one mile from



SOURCE: USGS; Pittman & Hames Associates, 2000;
San Mateo County General Plan, Rural Land Use Map, 1986;
Millbrae General Land Use Map,
and San Bruno General Land Use Map

1998.898E: Hetch Hetchy Water Treatment Chloramine Conversion Project EIR / 990095

Figure IV.B-4
Harry W. Tracy WTP Site Land Use

the site, are lands leased to the GGNRA (see Figure IV.B-4). However, there is no direct roadway access from the project site to the GGNRA lands because the San Andreas Reservoir is situated in between these two areas. Southwest of the site lies I-280, directly beyond which is the city of San Bruno. Directly north of the site lies the Junipero Serra County Park, and to the east is the city of Millbrae. Within Millbrae, the Green Hills Country Club is roughly 1/2 mile east of the site.

The portions of San Bruno and Millbrae that fall within a one-mile radius of the site are low- to medium-density residential and contain mostly single-family houses, with some areas of 2- to 4-story, multifamily structures scattered throughout. The residential area closest to the site entrance is a garden apartment complex. There are also 10 school facilities located within a one-mile radius of the site, as shown in Figure IV.B-4.

Recreation

There are two large recreational areas near the site: the Junipero Serra County Park and the Green Hills Country Club. The Junipero Serra County Park lies adjacent to the site, with a public entrance on Crystal Springs Road approximately 1/2 mile from the site entrance. There are also several smaller parks within a one-mile radius of the site: Buckeye Park in San Bruno, the San Bruno City Park, and Bill Mitchell Lions Park in Millbrae.

The SFPUC leases land at the Harry W. Tracy WTP site on a month-to-month basis to Skyline Stables for horse stables and equestrian trails. Equestrian trails within the Harry W. Tracy WTP property boundaries are open only to members of Skyline Stables and lead to public trails on the western side of I-280. The Skyline Stables contain 52 stalls, leased by 18 families. Equestrians have used land in that area since the early 1900s, before it was purchased by the SFPUC.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for land use impacts, but it generally considers that the implementation of the proposed project would have a significant land use impact if it were to:

- substantially disrupt or divide the physical arrangement of an established community;
- substantially conflict with established recreational, educational, religious, or scientific uses; or
- have a substantial impact on the existing character of the community.

Land use impacts are evaluated with respect to compatibility of the proposed project with existing land uses and the potential effect the proposed project would have on land use patterns in the project vicinity.

2.2 IMPACTS

Summary of Impacts By Project Component

Table IV.B-1 provides a summary of the land use and recreation impacts associated with specific components of the proposed project and their respective level of significance.

TABLE IV.B-1
SUMMARY OF IMPACTS – LAND USE AND RECREATION

		Sunol Valley Sites			Pulgas Sites			
Impact	**Tesla Portal Site**	**San Antonio Pump Station Site**	**Alameda East Portal Site**	**Alameda West Portal Site**	**Pulgas Site**	**Pulgas Balancing Reservoir Site**	**Harry W. Tracy WTP Site**	**Secondary Discharge Locations**
Disruption or division of an established community	LS	LS	LS	LS	LS	LS	LS	LS
Conflicts with established uses	LS	LS	LS	LS	LS	LS	LS	LS
Impact on the existing character of a community	LS	LS	LS	LS	PSM	LS	LS	LS

SM = Significant Impact, can be Mitigated
LS = Less than Significant Impact
PSM = Potentially Significant Impact, can be Mitigated
SU = Significant Unavoidable Impact
B = Beneficial
N/A = Not Applicable

Disruption or Division of an Established Community

Because the project would be implemented on lands owned by the SFPUC, no residents or businesses would be displaced. Therefore, this impact is considered less than significant at all project locations.

Conflict with Established Uses

Tesla Portal Site

There are no existing educational, religious, or scientific uses located near the site. Temporary construction traffic impacts could occur at the Tracy Golf & Country Club in Chrisman as well as at the nearby cattle ranches. However, since the golf course is bisected by I-580, any increase in construction truck traffic to the site would be minimal compared to existing highway traffic.

Nearby residences and ranches would not be affected by construction noise and dust due the distance of these uses from the construction site. Since there would be minimal conflict with existing land uses, this impact is considered less than significant.

Sunol Valley Sites

There are no educational, scientific, or religious uses near the San Antonio Pump Station, Alameda East Portal, or Alameda West Portal sites. For the existing recreational uses, temporary construction impacts could occur, such as increased dust, noise, and truck traffic. These are not expected to affect the Sunol Valley Golf Course, as this facility is located 1-3/4 miles from the site. Construction impacts are also not expected to affect the Sunol Regional Wilderness, located 1-1/2 miles south of the site along Calaveras Road. Therefore, minimal conflict with existing recreational uses would occur, and this impact is considered less than significant.

Pulgas Site

Construction Impacts. There are no religious, educational, or scientific uses near the site that could be affected by the project. The recreational use of the Pulgas Water Temple and associated public areas could be disrupted during the construction period, although the proposed Pulgas facility site has no public access. The construction site for the new dechloramination facility would be about 600 feet south of the temple, and pipeline construction would occur within and adjacent to the temple grounds. As described in Section III.G, Construction Scenario, no weddings or events would be held at the temple during the construction period, which could last up to 14 months. This provision, included in the proposed project, would eliminate potential conflicts with established uses during the construction period. In addition, public access to the temple would likely be restricted for public safety reasons during pipeline construction within the temple grounds (occurring over six months).

Construction impacts could disrupt other recreational uses. Use of the trails by hikers and equestrians might be affected if construction were to block access or if concerns about conflicts between trucks and trail users were to restrict the number of permits issued. In order to minimize this disruption, the SFPUC could post signs at the Pulgas site entrance (six to eight weeks prior to construction) to alert motorists, bicyclists, pedestrians, and equestrians of the proposed construction schedule. Such signage would divert recreational users from the construction site and could provide alternate pathways for recreational users. Also, contractors could screen the construction site and equipment on weekends and store equipment so that it is not visible from the Pulgas Water Temple. These recommended improvement measures are described in Section V.N of the mitigation measures chapter.

Construction activities would be limited to weekdays so that there would be no conflicts with Bike Sunday. During project construction, maintenance trucks would continue to access the Pulgas site during Bike Sunday events. This would not be considered a significant impact, as this condition already occurs. It is unlikely that construction traffic would affect the use or atmosphere of the Filoli Estate House and Gardens, due to its distance from the construction site.

Due to their temporary duration, construction impacts on established recreational uses at the Pulgas site would be considered less than significant. However, improvement measures, as described above and in Section V.N of the mitigation measures chapter, are recommended to reduce disruption to recreational users during construction.

Operation Impacts. After project completion, the existing temple would not be physically changed by the proposed project. However, the project would divert the water that intermittently flows from the Hetch Hetchy Aqueduct through the historic temple site. Established recreational uses at the Pulgas Water Temple could be affected to the extent that visitors consider the sound of flowing water to be a major recreational appeal of the temple. To compensate for the loss of the sound of flowing water, the proposed project would include provisions to maintain as much of the existing sound and appearance of rushing water through the Pulgas Water Temple as is feasible, given operational requirements of the water system. This could consist of a pump system to return a portion of the flow to the temple, which could be controlled to operate during periods when water is diverted to Crystal Springs Reservoir. See Section IV.G, Cultural Resources, and Section V.G of the mitigation measures chapter, for a further discussion.

Operation of the proposed project could require one or two additional maintenance truck trips on Sundays, which would not be considered significant. Chemical deliveries, typically in 5,000-gallon tanker trucks, are currently made seven days a week to all SFPUC facilities. During project operation, there would be potential conflicts on weekends between chemical delivery trucks and bicyclists on Cañada Road during Bike Sunday, an established recreational use. However, as part of the proposed project, the SFPUC would restrict chemical deliveries to this facility to Monday through Saturday and would permit Sunday deliveries only in emergency situations (see Section III.3.1, Pulgas Dechloramination Facility and Contactor Pipeline). Therefore, operation of the proposed project would not substantially affect existing recreational uses and this impact would be less than significant.

Harry W. Tracy Water Treatment Plant Site

There are no educational, religious, or scientific facilities near the site. Construction of the project would temporarily disrupt the users of equestrian trails and stables located at the site. This impact would be less than significant because of its temporary duration. However, to reduce disruption to these users, the SFPUC could notify Skyline Stables and equestrian groups that use the Harry W. Tracy WTP site of the proposed construction schedule and construction locations in order to avoid potential conflicts and safety hazards during construction. This measure is described in Section V.N as a recommended improvement measure for a less than significant impact.

No construction noise, dust, or traffic impacts are expected to occur on surrounding land uses, such as the Junipero Serra County Park and Green Hills Country Club, due to their distance from the site. The impact on adjacent recreational uses is therefore considered less than significant.

Impact on the Existing Character of a Community

Tesla Portal Site

The character surrounding the site is largely agricultural, with one very low-density residential community (Chrisman) nearby. The new chlorine storage and feed system and improved loop road leading to the site would not be incompatible with the agricultural and low-density character of the area. One small outbuilding associated with the residence at the site would be demolished, and structures currently used for chlorine storage and feed would be abandoned. There would be no change to the existing residence. The project would result in one new structure; this building would cover approximately 15,000 square feet (100 feet by 150 feet) and would be 30 feet high. The scale of this building would be similar to that of existing structures and would not be incompatible with the agricultural and low-density character of the area. Therefore, the character of the community would not change, and this impact is considered less than significant.

Sunol Valley Sites

The area around the San Antonio Pump Station, Alameda East Portal, and Alameda West Portal sites is largely rural and resource-based. The construction of a new ammonia and chlorine feed system, a new access point from Calaveras Road, and a loop road would not conflict with the rural character of the area. Use of the site for the proposed facility would not detract from use of surrounding areas for such businesses as nurseries and gravel operations. The proposed structure would be approximately 15,000 square feet (100 feet by 150 feet) and 30 feet high. This building would not be out of character with the existing facility on the site and would not affect the character of the community. Therefore, the impact is considered less than significant.

Pulgas Site

The area directly surrounding the Pulgas site is protected open space, with an established low- to medium-density residential area farther east. One structure would be added, an aboveground storage structure roughly 20,000 square feet (100 feet by 200 feet) and 30 feet high. In addition, a new access driveway and truck turnaround would be constructed. The preferred alternative would require removal of several mature trees adjacent to Cañada Road; thus, the proposed facility would be visible from Cañada Road. While the proposed facilities and associated access driveway and trunk turnabout would not be incompatible with open space or residential communities, the addition of a 20,000-square-foot building could detract from the largely natural setting. Therefore, this impact is considered potentially significant but can be mitigated. This impact and mitigation measures are discussed further under Section IV.F, Aesthetics, and Section V.F of the mitigation measures chapter.

Harry W. Tracy Water Treatment Plant Site

The area directly surrounding the site is low- to medium-density residential, with parks and open space scattered throughout. The new chlorine and ammonia feed facilities would require an area of about 1,600 square feet (40 feet by 40 feet), and both structures would be 30 feet high. The proposed dechlorination facility would be smaller, covering 120 square feet (10 feet by 12 feet), and would be about 10 feet high. These structures would be smaller than those at the site and

thus would not change the character of the community. This impact is therefore considered less than significant.

REFERENCES – Land Use and Recreation

County of Alameda, *Draft Environmental Impact Report for the East County Area Plan*, 1993.

County of Alameda, *East County Area Plan*, 1994.

County of San Joaquin, *San Joaquin County General Plan 2010*, 1992.

County of San Mateo, *San Mateo County General Plan*, 1986.

East Bay Regional Park District, *Master Plan 1997*, 1996.

Hornor, Nancy, Chief of Planning and Technical Services, Golden Gate National Recreation Area, personal communication with Liisa Ecola, Pittman & Hames, 2000.

Naras, Joe, SFPUC Land and Resource Manager, personal communication with Liisa Ecola, Pittman & Hames, 1999.

San Francisco Public Utilities Commission and Golden Gate National Recreation Area (SFPUC and GGNRA), *Grant of Scenic Easement and Scenic and Recreation Easement,* 1969.

San Francisco Public Utilities Commission (SFPUC), *Peninsula Watershed Management Plan*, Draft, 1998.

Trejo, Ricardo, Park Ranger 3, Edgewood Park, personal communication with Liisa Ecola, Pittman & Hames, 1999.

C. BIOLOGICAL RESOURCES

The Initial Study for this project evaluated the potential for impacts on biological resources associated with development of project-related facilities (see Appendix A). The Initial Study determined that impacts on biological resources could result from construction and operation of proposed facilities at all facility sites. In addition, the Initial Study identified potential program-level impacts on aquatic habitats due to secondary discharges. Therefore, this section evaluates potential impacts on biological resources at all facility sites and secondary discharge locations.

1.0 SETTING

1.1 REGIONAL SETTING

The proposed project facilities were subjected to a thorough review of biological and wetland resources in fall 1999, which is presented in the *Hetch Hetchy Water Treatment Project--Chloramine Conversion Draft Biological Resources Background Report* (ESA, 1999). The Pulgas site has received ongoing attention due to the large number of nearby rare plants and wildlife species. Biological and wetland reports for the Pulgas site and related project sites include Tetra Tech, Inc. (1998), Environmental Science Associates (1994), McGinnis (1993; 1992), and Ralph Osterling Consultants, Inc. (1993).

The locations of 10 proposed project sites and alternative sites, including survey boundaries for biological and wetland resources. were described in the *Draft Biological Resources Background Report* (ESA, 1999). That report is incorporated herein by reference. Several facilities proposed throughout the project service area are analyzed at a programmatic level, including nitrification control systems, reservoir upgrades, as-needed modifications to Bay Area Water Users Association (BAWUA) systems, uncontrolled and controlled discharges, and dechlorination at the Lake Merced Pump Station.

Tesla Portal Area

The Tesla Portal site lies on the eastern slope of the Diablo Range within the San Joaquin Valley biological subregion, roughly 25 miles south of the city of Tracy in San Joaquin County. This area has historically supported agriculture and grazing, which is the primary land use surrounding the Tesla Portal site. This region is characterized by rolling hillsides and grasslands. This portion of the Diablo Range is biologically active because of the range of habitats that occur in the mountains to the west and the undeveloped nature of most areas. The Diablo foothills in this area provide habitat for the endangered San Joaquin kit fox at the extreme northern limit of its range.

Sunol Valley Area

The Sunol Valley project area lies in the central portion of the Diablo Range within the San Francisco Bay Area biological subregion. This area has been managed for livestock grazing for over 200 years, though none of the three Sunol Valley project sites have been recently

grazed. The historic levels of grazing have contributed to a regional decline of some plant and wildlife species, favoring grassland-adapted species. Nonetheless, productive grasslands, coast live oak woodlands, and chaparral habitats persist in some areas and are present in or near each of the Sunol project sites.

Alameda Creek is the principal drainage for the Sunol Valley. Barriers to fish migration, such as the Bay Area Rapid Transit (BART) invert and Alameda County Water District rubberdams, have impeded upstream migration of anadromous fish. In the event that fish surmount these downstream barriers, the SFPUC Niles and Sunol Dams may also block upstream migration. In recent years, steelhead trout have frequently been observed attempting to pass the downstream barriers and to migrate up Alameda Creek. Some steelhead have been caught and released upstream, although this did not result in successful spawning (Alexander, 1999). Two such captured and released steelhead were radio-tagged and one was tracked to Stonybrook Creek. Healthy populations of resident rainbow trout are landlocked behind watershed dams. Recent genetic tests of some Alameda Creek rainbow trout revealed them to be descendents of the central California Evolutionarily Significant Unit (ESU) of steelhead, a federally threatened species (Applied Marine Sciences, 2000). The temperature and flow regime in lower Alameda Creek supports only migratory habitat for salmonids. The headwater reaches of the watershed, such as Sunol Regional Park and Arroyo Mocho, however, provide suitable spawning and rearing habitat for steelhead. The Alameda Creek Fisheries Restoration Workgroup is currently investigating the feasibility of restoring downstream portions of the watershed and enabling migratory fish to pass the barriers. Lower Alameda Creek does support a good assemblage of native warmwater fishes, such as Sacramento sucker (*Catostomus occidentalis*), Sacramento squawfish (*Ptychocheilus grandis*), California roach (*Hesperoleucus sp.*), threespine stickleback (*Gasterosteus aculeatus*), and Pacific lamprey (*Lampetra hubbsi*) (Moyle, 1993). Some of the warmwater species found in Alameda Creek, such as the bass and sunfish, are exotic species and probably prey on the native fishes, as they do in other California stream systems, and thus have contributed to the decline in the native fish species.

San Francisco Peninsula

The San Mateo County project area is located in the San Francisco Bay Area biological subregion within California's geologically complex coastal range and adjacent to the San Andreas rift zone. The San Francisco Peninsula project area has been active for water diversion since at least 1875, when Upper Crystal Springs Dam construction began (Hanson, 1985). Since that time, the area has undergone repeated facility construction for water development, but many native habitats have remained relatively undisturbed by urban development. The Peninsula Watershed has the highest concentration of rare, threatened, and endangered species in the nine-county Bay Area. In addition to landscape manipulations associated with reservoir management (sedimentation basins, fluctuating water levels, etc.), the watershed has not experienced an episodic, natural fire in over 100 years. Thus, wetland boundaries, litter (decaying organic matter on the forest floor), and vegetation densities have changed, and natural processes and patterns have shifted over time. The soils are derived from heterogeneous parent materials and

support not only diverse habitats but also isolated islands of unique plant and animal assemblages.

1.2 EXISTING ENVIRONMENT

This section briefly describes the vegetation, wildlife habitat, and wildlife species known to be or likely to be found on each site. The distribution and characteristics of each habitat type and associated wildlife species are listed in Table IV.C-1. More detailed descriptions of natural resources found at all proposed facility sites are provided in the *Draft Biological Resources Background Report* (ESA, 1999) and are incorporated herein by reference.

Tesla Portal Site

Grazed annual grasslands dominate the undeveloped portions of the Tesla Portal site. The proposed site supports two distinct vegetative communities. Approximately one-third of this site consists of grazed annual grasslands, while the remaining portions are either paved or support ornamental vegetation.

Grazed annual grasslands dominate the undeveloped portions of the Tesla Portal site, consisting mostly of disturbed bare soil and sparse vegetation. An existing chlorine feed system occupies the majority of the site. The fenced portions of the site are mowed or otherwise maintained and support only common wildlife species.

Typical species expected at this site include European starling (*Sturnus vulgaris*), western meadowlark (*Sturnella neglecta*), Brewer's blackbird (*Euphagus cyanocephalus*), western scrub jay (*Aphelocoma californica*), song sparrow (*Melospiza melodia*), mourning dove (*Zenaida macroura*), and rock dove (*Columba livia*). Mammal species expected on the fringes of this area include western gray squirrel (*Sciurus griseus*), California mouse (*Peromyscus californicus*), and house mouse (*Mus musculus*). Amphibian and reptile species are expected to use this area only incidentally or not at all. Wildlife species noted at this site were California ground squirrel (*Spermophilus beecheyi*), Audubon's cottontail (*Sylvilagus audubonii*), and mourning dove, though habitat for many bird, reptile, and mammal species potentially occurs in the general project area. A review of the California Department of Fish and Game (CDFG) Wildlife Habitat Relationships (WHR) System for this area, combined with field surveys and local knowledge, produced a list of at least 101 wildlife species whose geographic ranges and habitat requirements include the annual grassland habitats in the Tesla Portal project area. This list includes 10 reptiles, 52 birds, and 13 mammal species (CDFG, 1999; ESA, 1999).

Alameda Creek and associated riparian vegetation provide habitat for a host of common wildlife, including western toad (*Bufo boreas*), Pacific tree frog (*Pseudacris* [=*Hyla*] *regilla*), common garter snake (*Thamnophis sirtalis*), gopher snake (*Pituophis melanoleucus*), and many small mammal species. The retreating summertime water flows concentrate fish, tadpoles, and aquatic insects in small pools. These areas are favorite hunting grounds for birds such as great blue heron (*Ardea herodius*), great egret (*Casmerodius albus*), and snowy egret (*Egretta thula*).

TABLE IV.C-1
VEGETATION COMMUNITIES AND CORRESPONDING WILDLIFE HABITATS AT THE PROPOSED PROJECT SITES

Project Component	Vegetation Communities Present	Corresponding Wildlife Habitat
Tesla Portal Site	Urban	Urban / developed
	California annual grassland	Annual grassland
San Antonio Pump Station Site	California annual grassland	Annual grassland
	Arroyo willow	Willow riparian
	Narrow-leaved cattail	Wet seep
Alameda East Portal Site	Urban	Urban / developed
	California annual grassland	Annual grassland
	Coast live oak woodland	Coastal oak woodland
Alameda West Portal Site	California annual grassland	Pasturelands
	Coast live oak woodland	Coastal oak woodland
	Coastal scrub	Coastal scrub
Pulgas Site	Ornamental	Urban / ornamental
	California annual grassland	Annual grassland
	Arroyo willow riparian	Willow riparian
	Coast live oak woodland	Coastal oak woodland
Pulgas Balancing Reservoir Site	Ornamental	Urban / ornamental
Harry W. Tracy WTP Site	Ornamental	Urban / ornamental

SOURCES: ESA, 1999; ESA, 1994

Typical resident fish species in Alameda Creek include Sacramento squawfish, largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), chub (*Gila* spp.), sculpin (*Cottus* spp.), and mosquito fish (*Gambusia affinis*). Due to a downstream impoundment in Alameda Creek, this stream is not accessible to the federally threatened Central California coast steelhead (*Oncorhynchus mykiss*). Lower Alameda Creek contains a small population of steelhead, which is currently known to extend upstream to a barrier associated with the BART tracks in Fremont. Potential measures to restore steelhead runs in the Alameda Creek watershed are currently being evaluated by the Alameda Creek Fisheries Restoration Workgroup. Such measures may include installation of fish ladders at barriers to provide migratory access to the upper Alameda Creek watershed. Furthermore, the Alameda Creek Fishery Enhancement Project (see Section VI.B.1.0, Related Projects and Plans) would also provide for an increase in fish habitat below Calaveras Dam. That project includes the installation of an impoundment structure to enhance fishery habitat, and a water recapture system to return the water to the City's reservoir. The scope of work includes a fish release structure, a small recovering impoundment structure, a

pump station to transport recovered water, and a pipeline from the impoundment structure to the terminal reservoirs. The impoundment would be located on Alameda Creek near the Sunol Valley WTP, about one mile upstream of the San Antonio Pump Station, and would consist of an inflatable rubber dam to maintain a pool of water. A small pump station would be constructed near the impoundment site. Water would be pumped from the impoundment through a new pipeline that would run parallel to the existing Calaveras Pipeline, and would intercept the San Antonio Pipeline near the San Antonio Pump Station. This would allow the water that is released into Alameda Creek to be recaptured, pumped to, and stored in San Antonio Reservoir for future City use.

San Antonio Reservoir, which receives water transfers from the San Antonio Pump Station, supports a warmwater fishery. Species typically found in warmwater reservoirs include, among others, resident rainbow trout, largemouth bass, smallmouth bass (*Micropterus dolomieu*), striped bass (*Morone saxatilis*), bluegill, and crappies (*Promoxis* spp.). Fish species known to occur in San Antonio Creek upstream of the reservoir include rainbow trout, Sacramento sucker, and prickly sculpin (Leidy, 1999).

San Antonio Pump Station Site

Three vegetation types are present at this site: willow riparian, freshwater meadow, and California annual grassland. Willow riparian occurs along the northern and southern perimeters of the site. Species in this community include arroyo willow (*Salix lasiolepis*), cattail (*Typha latifolia*), mule fat (*Baccharis salicifolia*), coast live oak (*Quercus agrifolia*), and firethorn (*Pyracantha angustifolia*). The freshwater meadow is intermixed with the California annual grassland and includes rush (*Juncus* sp.), knotweed (*Polygonum* sp.), and willowherb (*Epilobium* sp.). California annual grassland was the largest community at the site. Dominant species in this community are ripgut brome (*Bromus diandrus*), slender wild oat (*Avena barbata*), and soft chess (*Bromus hordaceous*). Associated species included yellow-star thistle (*Centaurea solstitalis*), bristly ox-tongue (*Picris echioides*), and milk thistle (*Silybum marianum*).

A review of the CDFG WHR System (CDFG, 1999), combined with field surveys and local knowledge, produced a list of at least 101 wildlife species whose geographic ranges and habitat requirements include the annual grassland habitats in the San Antonio Pump Station region. This list includes 9 reptiles, 37 birds, and 15 mammal species (CDFG, 1999; ESA, 1999). For most of the birds and larger mammals, these grasslands provide foraging, resting, or hunting habitat that is occasionally visited as part of a much larger and diverse home range that encompasses other nearby habitat types. This list of occasional visitors includes deer, moderate- to large-size predators, and scavengers such as coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), striped skunk (*Mephitis mephitis*), spotted skunk (*Spilogale putorius*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), and several species of bats, including the little brown myotis (*Myotis lucifugus*) and Mexican free-tailed bat (*Tadarida brasiliensis*). Birds expected to use these grasslands include western kingbird (*Tyrannus verticalis*), loggerhead shrike (observed) (*Lanius ludovicianus*), American crow (*Corvus brachyrhynchos*), western bluebird (*Sialia mexicana*), and several raptors such as white-tailed kite (*Elanus caeruleus*), red-shouldered hawk (*Buteo lineatus*), and red-tailed hawk (*Buteo jamaicensis*). A portion of these grasslands may be

part of the relatively small home range of many woodland birds and may be visited on a daily basis.

Alameda East Portal Site

This site is adjacent to Calaveras Road on the east slope of the Sunol Valley, just uphill from the San Antonio Pump Station. It is mostly covered with gravel and compacted grassland parking areas. Land use around this predominantly rural site is grasslands, with steep wooded and grassy slopes, and rocky cliffs with talus further upslope. A steep, upward-sloping hillside supporting coast live oak woodland abuts the eastern perimeter of the site. Beyond the gravel on the western side, a steep, downward-sloping hillside supports an open annual grassland consisting mostly of yellow-star thistle and a few blue elderberry (*Sambucus mexicana*) and coyote brush shrubs. Yellow-star thistle also occurs in an adjacent grassland south of the project site. A small population of cattail is present in a narrow drainage in the northeastern corner of the site.

Site conditions do not provide particularly good wildlife habitat, though high-quality, undisturbed grasslands and woodland habitat occur on the hillsides east (upslope) of the site. Small and large mammals and birds are expected to use the Alameda East Portal project site only incidentally in transit to neighboring upslope grasslands and oak woodlands. Such species include western fence lizard (*Sceloporus occidentalis*), common kingsnake (*Lampropeltis getulus*), gopher snake, western meadowlark, white-crowned sparrow (*Zonotrichia atricapilla*), loggerhead shrike (*Lanius ludovicianus*) (observed), black-tailed jackrabbit (*Lepus californicus*), and California mule deer (*Odocoileus hemionus*). No wildlife species were noted in the drainage, but Pacific tree frog, common garter snake, and red-winged blackbird (*Agelaius phoeniceus*) are expected to use this area. Due to the level of site disturbance, the CDFG WHR System is not considered applicable to describing wildlife use of this site.

Alameda West Portal Site

This site is 1/2 mile west of the San Antonio Pump Station on the east-facing slope of Sunol Valley. This fenced site houses industrial chemical storage facilities. Nonnative herbaceous plants such as fennel (*Foeniculum vulgare*), yellow-star thistle, and annual grasses are present within the fenced area. The site had been recently mowed and thus some plants are unidentifiable. An adjacent open California annual grassland is present on the eastern and southern sides of the fenced area and is currently mowed. A stand of coyote brush (*Baccharis pilularis*) occurs in the northeast adjacent to the fenced area and annual grassland. A few coyote brush shrubs are sparsely distributed within the grassland. A dense stand of mature coast live oak intermixed with coastal scrub occurs on a steep, upward-sloping hillside on the western side of the survey area. Species present include California buckeye (*Aesculus californica*), coast live oak, poison oak (*Toxicodendron diversilobum*), and sticky monkey flower (*Mimulus aurantiacus*).

The Alameda West Portal site is best characterized as a trampled area with poor quality wildlife habitat. The area inside the fenceline is mostly barren, with no burrows or other signs of small mammal activity. Large mammals do not have access to this fenced area. East of the fenceline

the site opens into pasturelands with few small mammal burrows, but is still considered devoid of most wildlife support functions. Small mammals such as Audubon's cottontail and California ground squirrel may use this pasture, which also provides forage for raptors such as red-tailed hawk, Swainson's hawk (*Buteo swainsonii*), and golden eagle (*Haliaeetus leucocephalus*), all of which were observed overhead during the site visit. Mature mixed oak woodlands habitat and mixed chaparral cover the east-facing slope above the project site, though these areas are outside the proposed site boundary.

Peninsula Aquatic Habitat

- The three Peninsula sites (Pulgas Balancing Reservoir, Pulgas site, and Harry W. Tracy WTP) discharge water into two natural bodies of water, Upper Crystal Springs Reservoir and San Andreas Reservoir. These coldwater reservoirs and their tributaries serve as habitat for a variety of fish species and other aquatic life. Though there are more nonnative fish species, such as mosquitofish and largemouth bass, native fish species such as resident rainbow trout (*Oncorhynchus mykiss*), Sacramento sucker, and threespine stickleback also occur in the watershed. In addition to fish species, the reservoirs provide habitat for western toad (*Bufo boreas*) and gopher snake (*Pituophis melanoleucus*), and reservoir fish serve as forage for blue heron (*Ardea herodius*), great egret (*Casmerodius albus*), snowy egret (*Egretta thula*), and other bird species. Aquatic plants provide food-chain support for insect larvae and water bugs such as stoneflies (Plecoptera), mayflies (Ephemoroptera), water beetles (Coleoptera), and true aquatic bugs (Heteroptera). The aquatic habitats of the reservoirs could be affected in the case of an accidental release of deleterious substances.

Pulgas Site

Annual grasslands habitat covers over 90 percent of the Pulgas site construction area. Disturbed oak woodlands are present in the area of the proposed access road from Cañada Road; the remaining portions of the site are barren from recent tilling. An unnamed drainage with extensive oak woodland and riparian habitat forms the northern boundary of the site. Figure IV.C-1 shows the general locations of vegetation communities and prominent natural features in the vicinity of the Pulgas site.

California annual grassland is the dominant plant community at this site. Within this community, the dominant species include grasses, Italian wildrye (*Lolium perenne*), and ripgut brome, and yellow-star thistle, an herbaceous, invasive, nonnative plant. Associated species in this grassland include black mustard (*Brassica nigra*), soft chess, and narrowleaf flax (*Linum bienne*). Creeping wildrye (*Leymis triticoides*), a rhizomatous grass, is distributed in patches throughout the California annual grassland. Several patches occur in the shallow depressions of the site. Three valley oak trees (*Quercus lobata*) of substantial size (diameter at breast height[1] [dbh] greater than 8 inches) occur along the southern perimeter of the site. These trees are part of the extensive valley and coast live oak woodland that occurs outside the project site.

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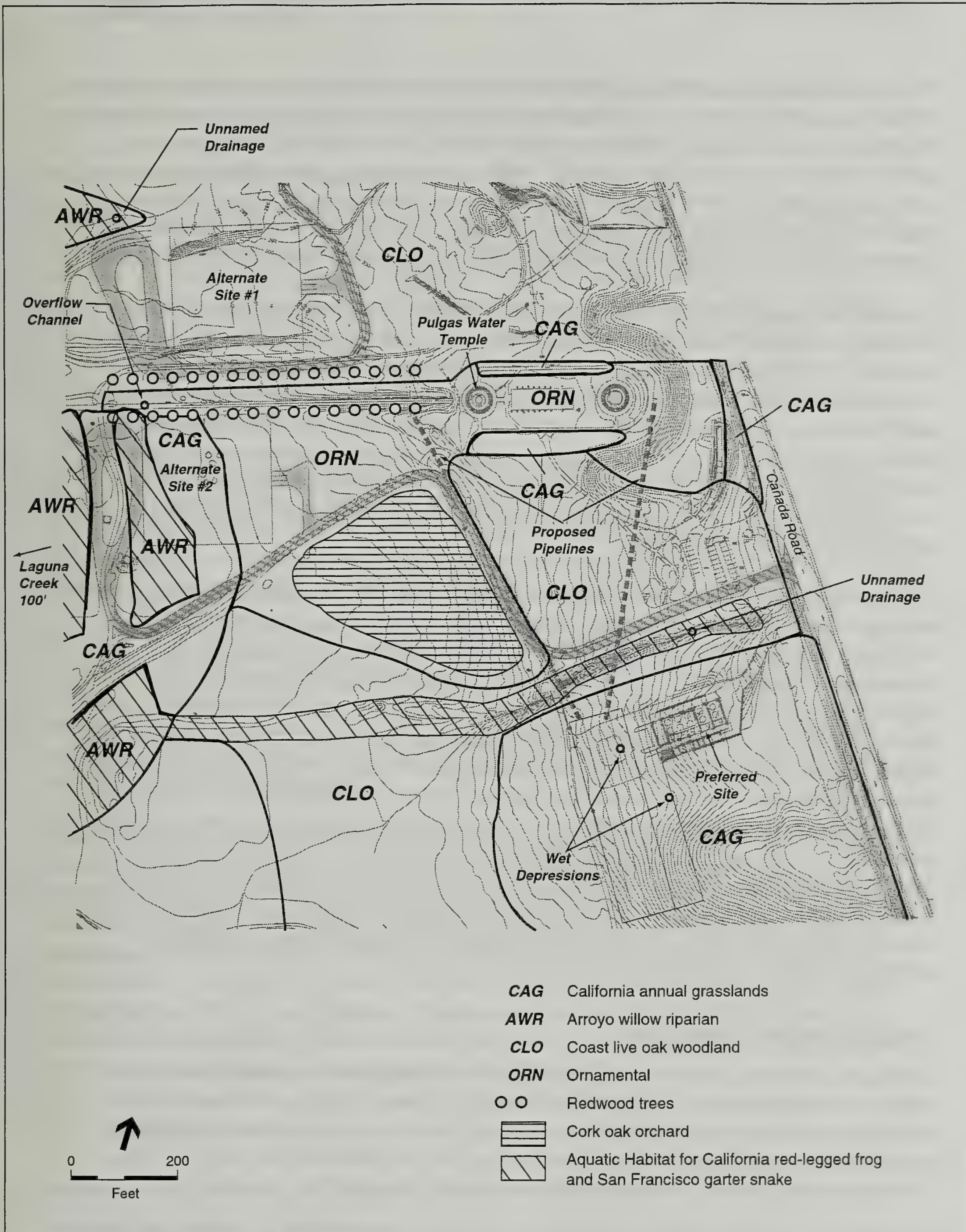
1 Diameter at breast height is typically measured at a height of 4.5 feet above grade.

Approximately 10 coast live oak trees with a dbh greater than 8 inches occur along Cañada Road, the eastern perimeter of the site. Coast live oak intermixes with coyote brush and Lombardy poplar (*Populus nigra*) and visually screens the area of the proposed new building. An unnamed creek forms the northern extent of the site. The creek supports a dense community of arroyo willow, poison oak, California blackberry, and coast live oak.



SOURCE: Environmental Science Associates, 1999, Revised 2000.

1998.898E: Hetch Hetchy Water Treatment Chloramine Conversion Project EIR / 990095

Figure IV.C-1
Pulgas Dechloramination Facility Vegetation Communities and Prominent Natural Features

The common wildlife species in grasslands at the Pulgas site are similar to those described for the San Antonio Pump Station site, though the Pulgas site includes species with more of a coastal distribution. A wide range of wildlife species potentially occurs within the annual grassland habitats at this site. A review of the CDFG WHR System, combined with field surveys and local knowledge, produced a list of at least 101 wildlife species whose geographic ranges and habitat requirements include the annual grassland habitats near the Pulgas site. This list includes 2 amphibian species, 15 reptiles, 62 birds, and 22 mammal species (CDFG, 1999; ESA, 1999).

The areas south and east of the temple include a reflecting pool, a wooded area between the reflecting pool and the western (gated) parking lot, the areas of proposed road widening south of the temple, and the work area adjacent to the overflow channel west of the temple. The vegetation in this area consists of an open turf lawn grass and a dense stand of ornamental trees and a few shrubs. Monterey pine (*Pinus radiata*), fruit trees (*Prunus* spp.), and Lombardy poplar are the dominant ornamental trees in this area. Associated tree species included coast live oak (*Quercus agrifolia*), a native species. In addition, a few California blackberry (*Rubus ursinus*) occur in the shrub area. An ornamental groundcover plant and periwinkle (*Vinca major*) form the understory of the trees and shrubs.

The areas south and east of the reflecting pool are landscaped with grass and ornamental species and provide only limited wildlife habitat values. Native wildlife support functions in these landscaped areas have been greatly reduced due to landscaping with turf grass and other ornamentals. Wildlife species composition is typical of highly disturbed urban areas and includes species that thrive in urban settings. It should be noted that bird and mammal species associated with adjacent coastal oak woodlands habitat may be observed in the landscaped temple area, but derive relatively few habitat benefits from this area. Typical species expected here include European starling, western meadowlark, Brewer's blackbird, western scrub jay, song sparrow, mourning dove, and rock dove. Mammal species expected on the fringes of this area include western gray squirrel, California mouse, and house mouse. Habitat values for amphibians and reptiles are low within the landscaped (grassy and mulched) temple area, with habitat quality for these taxa generally dictated by the intensity of landscape maintenance. The area west of the temple adjacent to the overflow channel is vegetated with periwinkle and provides similarly low wildlife habitat values.

Pulgas Balancing Reservoir Site

The Pulgas Balancing Reservoir site is mostly paved, with introduced vegetation species and mowed grasslands in the unpaved portions of the site. A sparse collection of ornamental trees and shrubs is present in the unpaved areas of the site. Species observed include coyote brush, nonnative ornamental pines (*Pinus* sp.), and a nonnative ornamental willow (*Salix* sp.). Coast live oak woodland occurs on the adjacent hill to the north.

No wildlife species are expected to use the paved portions of the site, and few are expected to use the mowed road shoulder or ornamental areas. The site is not contiguous with nearby coastal oak woodland or grasslands habitat. Native wildlife support functions at this site have been greatly reduced due to paving, mowing, and the dominance of ornamental species. Wildlife

species using this site are expected only incidentally from adjacent coastal oak woodlands or grasslands habitat.

Harry W. Tracy Water Treatment Plant Site

This site is located within the boundaries of the Harry W. Tracy WTP, immediately adjacent to the existing water treatment facilities. Two alternative sites located on adjacent areas are proposed for the chlorine and ammonia feed facility. Both sites are bordered to the south by a paved road, to the north by a parking lot, and to the east by landscaped vegetation. The western site is bordered by a building to the west. The southern site is bordered by landscaped vegetation. The proposed dechlorination system would be located immediately adjacent to the existing treated water reservoir. The description of wildlife that follows characterizes all proposed sites at the WTP.

The vegetation at the western location consists mostly of ornamental plants. Three eucalyptus (*Eucalyptus globulus*) trees intermix with adjacent shrub and nonnative grassland communities. A woody vine, English ivy (*Hedera helix*), occurs adjacent to the parking lot and in some areas of the understory of the eucalyptus trees. A prostrate manzanita shrub (*Arctostaphylos* sp.), blue blossom (*Ceanothus thyrsiflorus*), and coast live oak tree saplings occur in the understory.

A nonnative ornamental shrub (*Acacia* sp.) is the dominant species at the eastern location. The ornamental shrub forms a dense stand and is adjacent to several French broom (*Genista monospessulana*) plants, which is an invasive, nonnative woody shrub. A highly disturbed, nonnative annual grassland occurs across the paved road within approximately 50 feet of the proposed site. Purple-star thistle (*Centaurea calcitrapa*), an invasive nonnative species, is the dominant species in the grassland.

This site is heavily vegetated with invasive ornamental species and is not contiguous with adjacent natural habitats. Few native plant species occur at the project site or in the surrounding area. Wildlife species expected here are typical of those in disturbed urban areas and include species that thrive in urban settings. Typical species expected at this site include European starling, western meadowlark, Brewer's blackbird, western scrub jay, Steller's jay, song sparrow, mourning dove, and rock dove. Cliff swallows (*Hirundo pyrrhonota*) may nest on buildings at this site but would not use the eucalyptus or acacia habitats. Mammal species expected on the fringes of this area include western gray squirrel, California mouse, and house mouse. Amphibian and reptile species are expected to use this area only incidentally or not at all.

1.3 WETLANDS

Regulation of Activities in Wetlands

Wetlands and nonwetland water resources (e.g., rivers, streams and natural ponds) are a subset of "waters of the United States"[2] and receive protection under Section 404 of the Clean Water Act.

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2 The regulatory term "waters of the United States," as used by the U.S. Army Corps of Engineers, has broad meaning and incorporates both deep-water aquatic habitats and special aquatic sites, including wetlands.

Wetlands are ecologically productive habitats that support a rich variety of both plant and animal life. The sensitivity of wetlands has increased as a result of their role as recharge areas and filters for water supplies and importance in offsetting urban and agricultural development. In a jurisdictional sense, there are two definitions of a wetland, one definition adopted by federal agencies and a separate definition adopted by the State of California.

The regulations and policies of various federal agencies (e.g., U.S. Army Corps of Engineers [Corps]; Natural Resource Conservation Service [NRCS]; U.S. Environmental Protection Agency [USEPA]; U.S. Fish and Wildlife Service [USFWS]; National Marine Fisheries Service [NMFS]) mandate that the filling of wetlands be avoided to the extent possible. The Corps has primary federal responsibility for administering regulations that concern waters and wetlands within the project area. In this regard, the Corps acts under two statutory authorities, the Rivers and Harbors Act (Sections 9 and 10), which governs specified activities in "navigable waters," and the Clean Water Act (Section 404), which governs specified activities in "waters of the United States," including wetlands. The Corps requires that a permit be obtained if a project proposes placing structures within navigable waters and/or alteration of waters of the United States.

Under Sections 1600-1607 of the California Fish and Game Code, CDFG regulates activities that would alter the "bed, channel, or bank of any river, stream, or lake designated by the department in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit...." CDFG is also authorized to develop mitigation measures and to enter into a Streambed Alteration Agreement (SAA) with applicants that propose a project that would adversely affect a river or stream, including intermittent and ephemeral streams. The State Water Resources Control Board (SWRCB) must certify that a Corps permit action meets state water quality objectives (Section 401, Clean Water Act).

Potential Jurisdictional Wetlands

A formal jurisdictional delineation[3] of the project sites has not been completed. Based on a preliminary field reconnaissance, potential jurisdictional waters of the U.S. that could be affected by the proposed project occur at the following project sites:

- Tesla Portal Site
- San Antonio Pump Station Site
- Alameda East Portal Site
- Pulgas Site

Detailed descriptions of these wetland areas are provided in the impacts discussion.

[3] A formal jurisdictional wetland delineation includes determination of a wetland based on the evaluation of dominant plant species, soil characteristics, and hydrologic characteristics of the area in question and verification by the Corps. Formal jurisdictional delineation of other water-related features includes data collection and Corps and/or CDFG verification of width at ordinary high mark and length of each stretch at the corresponding width. Within tidal areas the mean high water and highest tide line is noted.

1.4 SPECIAL-STATUS SPECIES[4]

Regulatory Background

Federal Endangered Species Act

Under the Federal Endangered Species Act (FESA), the Secretary of the Interior and the Secretary of Commerce have joint authority to list a species as threatened or endangered (16 United States Code [USC] 1533[c]). Pursuant to the requirements of FESA, an agency reviewing a proposed project within its jurisdiction must determine whether any federally listed threatened or endangered species may be present in the project area and whether the proposed action will have a potentially significant impact on such species. In addition, the agency is required to determine whether the proposed action is likely to jeopardize the continued existence of any species proposed to be listed under FESA or result in the destruction or adverse modification of critical habitat proposed to be designated for such species (16 USC 1536[3], [4]). Therefore, project-related impacts to these species or their habitats would be considered significant in this EIR.

The USFWS also publishes a list of candidate species. Species on this list receive "special attention" from federal agencies during environmental review, although they are not protected otherwise under FESA. The candidate species are those for which the USFWS has sufficient biological information to support a proposal to list as endangered or threatened. Project impacts to such species would be considered significant in this EIR.

California Endangered Species Act

Under the California Endangered Species Act (CESA), the CDFG is responsible for maintaining a list of threatened and endangered species (California Fish and Game Code 2070). The CDFG also maintains a list of "candidate species," which are species that the CDFG has formally noticed as being under review for addition to either the list of endangered species or the list of threatened species. The CDFG also maintains lists of "species of special concern" which serve as watch lists. Pursuant to the requirements of CESA, an agency reviewing a proposed project within its jurisdiction must determine whether any state-listed endangered or threatened species may be present in the project area and determine whether the proposed project will have a potentially significant impact on such species. In addition, CDFG encourages informal consultation on any proposed project that may impact a candidate species. Project-related impacts to species on the CESA endangered list or threatened list would be considered significant in this EIR. Impacts to species of concern would be considered significant under certain circumstances.

Other Statutes, Codes, and Policies Affording Limited Species Protection

The federal Migratory Bird Treaty Act (16 USC, Section 703, Supp. I, 1989) prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the

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4 "Special-status" species are defined as those with any form of legal protection due to rarity or limited distribution, or any species of local concern whose presence might determine a significant impact under CEQA.

Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs. Birds of prey are protected in California under the Fish and Game Code, Section 3503.5, which states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "taking" by the CDFG. Any loss of fertile eggs, nesting raptors, or any activities resulting in nest abandonment would constitute a significant impact. This approach would apply to red-tailed hawk, American kestrel, burrowing owl, and other birds of prey.

The federal Bald Eagle Protection Act prohibits persons within the United States (or places subject to U.S. jurisdiction) from "possessing, selling, purchasing, offering to sell, transporting, exporting or importing any bald eagle or any golden eagle, alive or dead, or any part, nest, or egg thereof."

Vascular plants listed as rare or endangered by the California Native Plant Society (CNPS) (Skinner and Pavlik, 1994), but which have no designated status or protection under federal or state endangered species legislation, are defined as follows:

- List 1A: Plants presumed extinct in California
- List 1B: Plants rare, threatened, or endangered in California and elsewhere
- List 2: Plants rare, threatened, or endangered in California, but more numerous elsewhere
- List 3: Plants about which we need more information (a review list)
- List 4: Plants of limited distribution (a watch list)

In general, plants appearing on CNPS List 1 or 2 are considered to meet the California Environmental Quality Act Section 15380 criteria, and effects to these species are considered significant.

Sensitive Habitats

Willow riparian plant communities (Central coast riparian scrub) are considered sensitive habitat by CDFG due to their scarcity, reduction of extent in California, and their important role in the ecology of special-status species (Holland, 1986). This vegetation type occurs in an unnamed creek running through the Pulgas site construction area.

Special-Status Species in the Project Areas

ESA compiled a comprehensive list of special-status plant and animal species that could occur in the vicinity of the proposed sites, and evaluated each site for species potential to occur. The comprehensive list, presented in Appendix C, includes species listing status, habitat requirements, potential to occur, and period of identification or flowering. Table IV.C-2 summarizes the key special-status species either known to occur or with moderate to high

TABLE IV.C-2
SPECIAL-STATUS SPECIES REPORTED OR WITH MODERATE POTENTIAL TO OCCUR AT THE TESLA PORTAL AND SUNOL VALLEY SITES

Common name *Scientific name*	Listing Status USFWS/ CDFG/CNPS	Potential to Occur[a]
SPECIES LISTED OR PROPOSED FOR LISTING		
Amphibians		
California tiger salamander *Ambystoma californiense*	FC/CSC/--	Moderate. Pasturelands between Alameda Creek and the Alameda West Portal site may provide upland aestivation habitat; no breeding habitat noted near the site.
Mammals		
San Joaquin kit fox *Vulpes macrotis mutica*	FE/CT/--	Moderate. A suitable burrow and supporting grasslands habitat was noted at the Tesla site; this site is within the San Joaquin kit fox range.
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN		
Birds		
Short-eared owl *Asio flammeus (nesting)*	--/CSC/--	Low – Moderate. Nesting habitat may occur at the San Antonio Pump Station and Tesla Portal sites, though habitat is considered marginal.
Loggerhead shrike *Lanius ludovicianus*	FSC/CSC/--	Moderate. Two adult shrikes were observed near the San Antonio Pump Station site; nesting may occur in large shrubs at this site. No breeding potential at other sites.
Burrowing owl *Speotyto (=Athene) cunicularia (burrow sites)*	FSC/CSC/--	Moderate. A suitable burrow and supporting grasslands habitat was noted at the Tesla Portal site; this site is within the burrowing owl's range.

STATUS CODES:

Federal Categories (USFWS)

FE = Listed as endangered by the federal government
FT = Listed as threatened by the federal government
FPE = Proposed for listing as endangered
FPT = Proposed for listing as threatened
FC = Candidate for federal listing
FSC = Federal species of concern

State Categories (CDFG)

CE = Listed as endangered by the State of California
CT = Listed as threatened by the State of California
CR = Listed as rare by the State of California
CSC = California species of special concern

[a] High Potential = Species expected to occur and meets all habitats as defined in list.
Moderate Potential = Habitat only marginally suitable or suitable but not within species geographic range.
Low Potential = Habitat does not meet species requirements as currently understood in the scientific community.

SOURCES: CNDDB, 1999; CDFG, 1999

potential to occur at the Telsa Portal and/or Sunol Valley sites. Table IV.C-3 summarizes these species for Peninsula area sites. Species with low potential to occur are described in Appendix C.

Vegetation types and wildlife habitats were characterized on the basis of both records and field observations. Reconnaissance-level surveys of the project sites were performed by Environmental Science Associates (ESA) ecologists on August 16, 1999 and September 10, 1999. The purpose of these visits was to gather information on vegetative communities, wildlife habitats, and habitat use on and surrounding the project sites, and to verify the results of previous biological reports. All undeveloped project areas not contained within roadways or developed areas were thoroughly walked using a meandering pattern, including adjacent habitats that appeared suitable for sensitive species. ESA's plant ecologist conducted a combination of reconnaissance and site-specific wetland surveys on September 10, 1999. Protocol-level surveys for listed wildlife species were not conducted for this analysis, partly due to seasonal restrictions but also because ESA has previously conducted surveys at the sites (SFWD, 1994). The potential for special-status species occurrence at individual project facilities is discussed below.

Tesla Portal Site

The Tesla Portal site is highly disturbed, and plants are sparsely disturbed. As a result, no special-status plants are likely to occur at this site. Grazing and maintenance activities have changed the disturbance regime and have helped to retain the current vegetation dynamics in the project site and surrounding area.

The Tesla Portal site is within the known range of the federal endangered and state threatened San Joaquin kit fox (*Vulpes macrotis mutica*), and the burrowing owl (*Speotyto* [=*Athene*] *cunicularia*), a federal and state species of concern. A previous reconnaissance of the project site did not identify habitat for these species (Tetra Tech Inc., 1998). During ESA's 1999 site visit, an isolated ground squirrel burrow of suitable dimensions and characteristics to support San Joaquin kit fox or burrowing owl was identified on the berm in the northeastern corner of the site. No sign of either species was noted, and it is suspected that this burrow is not currently used by these species. However, the presence of friable soils and burrows of this type indicate suitable habitat for both the San Joaquin kit fox and the burrowing owl. No other habitat for special-status species was identified on the project site.

The grasslands at this site provide potential foraging habitat for raptors; however, nesting habitat is not available (except for burrowing owl) in or near the project site.

Habitat for western spadefoot toad (*Scaphiopus hammondii*), San Joaquin coachwhip (*Masticophis flagellum ruddocki*), California horned lark (*Eremophila alpestris actia*), and San Joaquin pocket mouse (*Perognathus inornatus inornatus*) was previously reported in the general project area (Tetra Tech, Inc., 1998), but was not observed on the proposed Tesla Portal site. Appendix C describes the listing status and habitat requirements for these species relative to those found on the project site. No other special-status species are expected to occur at this site.

TABLE IV.C-3
SPECIAL-STATUS SPECIES REPORTED OR WITH MODERATE POTENTIAL TO OCCUR NEAR THE PENINSULA AREA PROJECT SITES

Common name *Scientific name*	**Listing Status USFWS/ CDFG/CNPS**	**Potential to Occur**[a]
	SPECIES LISTED OR PROPOSED FOR LISTING	
Amphibians		
California red-legged frog *Rana aurora draytonii*	FT/CSC/--	High. Potential breeding and aestivation habitat occur in an unnamed creek 50 feet north of the preferred dechloramination facility site. Also, known to occur northwest of the dechloramination site.
Reptiles		
San Francisco garter snake *Thamnophis sirtalis tetrataenia*	FE/CE/--	High. Potential breeding and aestivation habitat occur in an unnamed creek 50 feet north of Pulgas site. Also, known to occur northwest of the site.
	FEDERAL OR STATE SPECIES OF SPECIAL CONCERN	
Birds		
Cooper's hawk *Accipiter cooperi*	--/CSC/--	Moderate. Nesting habitat occurs in dense live oak stands northwest of Pulgas site.
Sharp-shinned hawk *Accipiter striatus*	--/CSC/--	Moderate. Usually nests in dense conifer stands; foraging habitat is available northwest of Pulgas site.
Northern harrier *Circus cyaneus*	--/CSC/--	Moderate. Nesting habitat is available at Pulgas site.
White-tailed kite *Elanus leucurus*	--/3511/--	Moderate. The dense oak and willow stands at Pulgas site may provide habitat, but occur off the project site.
Saltmarsh common yellowthroat *Geothlypic trichas sinuosa*	FSC/CSC/--	High. Willow stands northwest of Pulgas site provide high-quality nesting habitat; breeding is reported at Crystal Springs Reservoir.
Mammals		
Pallid bat *Antrozous pallidus*	--/CSC/--	Moderate. Roosting habitat is available in large-diameter trees near the Pulgas site.
Greater western mastiff bat *Eumops perotis californicus*	FSC/CSC/--	Moderate. Roosting habitat is available in large-diameter trees near the Pulgas site.
Small-footed myotis *Myotis ciliolabrum*	FSC/--/--	Moderate. Roosting habitat is available in large-diameter trees near the Pulgas site.
Long-eared myotis *Myotis evotis*	FSC/--/--	Moderate. Roosting habitat is available in large-diameter trees near the Pulgas site.
Fringed myotis *Myotis thysanodes*	FSC/--/--	Moderate. Roosting habitat is available in large-diameter trees near the Pulgas site.
Long-legged myotis *Myotis volans*	FSC/--/--	Moderate. Roosting habitat is available in large-diameter trees near the Pulgas site.
Plants		
Western leatherwood *Dirca occidentalis*	--/--/1B	Low–Moderate. Suitable habitat may occur northwest of Pulgas site.

TABLE IV.C-3
SPECIAL-STATUS SPECIES REPORTED OR WITH MODERATE POTENTIAL FOR OCCURRENCE NEAR THE PENINSULA AREA PROJECT SITES

STATUS CODES:

Federal Categories (USFWS)

FE = Listed as endangered by the federal government
FT = Listed as threatened by the federal government
FPE = Proposed for listing as endangered
FPT = Proposed for listing as threatened
FC = Candidate for federal listing
FSC = Federal species of concern

State Categories (CDFG)

CE = Listed as endangered by the State of California
CT = Listed as threatened by the State of California
CR = Listed as rare by the State of California
CSC = California species of special concern

CNPS

List 1A = Plants presumed extinct in California.
List 1B = Plants rare, threatened, or endangered in California and elsewhere.
List 2 = Plants rare, threatened, or endangered in California, but more common elsewhere.
List 3 = Plants about which more information is needed.
List 4 = Plants of limited distribution.

3511 = A Fully Protected Species

[a] High Potential = Species expected to occur and meets all habitats as defined in list.
Moderate Potential = Habitat only marginally suitable or suitable but not within species geographic range.
Low Potential = Habitat does not meet species requirements as currently understood in the scientific community.

SOURCES: CNDDB, 1999; CDFG, 1999

San Antonio Pump Station Site

The project site does not appear to be disturbed by maintenance activities such as mowing. However, based on the presence of disturbance-response species (e.g., Italian thistle and milk thistle), the site appears moderately disturbed. Sycamore alluvial woodland, a sensitive CDFG plant community, occurs about one mile east of the site (CNDDB, 1999). However, this woodland is not present within the project site. No special-status plants listed in Appendix C or Table IV.C-2 are likely to occur in this area. Nonnative species have displaced many of the native species at the site.

The San Antonio Pump Station site consists of mostly level annual grasslands at the bottom of Sunol Valley. Loggerhead shrike was the only special-status wildlife species listed in Table IV.C-2 to be observed near the site. This species may nest in the few large coyote brush shrubs, though evidence of nesting was not noted. Raptors are expected to forage at the site, but nesting habitat for this group is not available at the site. The California tiger salamander (*Ambystoma californiense*) has been identified in grasslands habitat within 3/4 mile of the site (CNDDB, 1999). All reported sightings of the salamander occurred on the hilltops and in tributary valleys above Sunol Valley, and not within the Alameda Creek floodplain. Grasslands habitat at the pump station site is considered to provide low-quality upland refugia for the salamander, based the lack of other nearby breeding sites and the general lack of cover (in the form of small mammal burrows or debris) on the site. Because of these conditions, California red-legged frog (*Rana aurora draytonii*) is also not expected at the site. The flat aspect of the site and tall grassland habitat, combined with the absence of nearby chaparral or woodland

vegetation communities or natural cover such as rock outcrops, prevent site suitability for Alameda whipsnake (*Masticophis lateralis euryxanthus*). No other special-status species are expected at this site.

Alameda East Portal

The grassland community at the project site is highly disturbed due to routine maintenance. This site is a level, disturbed hillside cut that does not provide any native plant or wildlife habitats. As a result, none of the special-status plants reviewed in Appendix C are likely to occur at this site. There are no reported accounts of special-status plants within a three-mile radius of the project site (CNDDB, 1999). Additionally, yellow-star thistle and nonnative grasses have displaced many of the native species in the area.

No special-status wildlife species are expected on this mostly barren site. This steep, east-facing hillside above the site provides grassland and oak woodland habitat, which may serve as foraging and nesting habitat for special-status bird species such as loggerhead shrike, Cooper's hawk, golden eagle, and red-tail hawk (all observed from the site), though no habitat for these or other special-status wildlife species is available on site. Habitat for the federally threatened Alameda whipsnake does not occur on the project site, but marginal habitat may be present on the grassy and wooded slopes located well upslope from the site. The Sunol–Cedar Mountain population of this species occurs within the project region and is isolated from the Hayward–Pleasanton Ridge population by I-680 (USFWS, 1997b). The proposed Alameda East Portal site does not provide Alameda whipsnake habitat.

Alameda West Portal

The project site appears to be routinely mowed; thus, species that favor disturbance in the annual grassland, such as slender wild oat and ripgut brome, are expected to occur in this area. Like the Alameda East Portal site, the proposed Alameda West Portal site is located on a hillside cut with extensive fill. The proposed work area within the fenceline is entirely fill materials and supports only low-growing ruderal grassland species.

Special-status plant species reviewed in Appendix C that potentially occur in the project area as well as in grassland communities include: maple-leaved checkerbloom (*Sidalcea malachroides*), a CNPS List 1B species; Mt. Diablo jewelflower (*Streptanthus hispidus*), a federal special concern species and CNPS List 1B species; showy Indian clover (*Trifolium amoenum*), a federal special concern species and CNPS List 1A species; and Oakland star-tulip (*Calochortus umbellatus*), a CNPS List 4 species. These species are not likely to occur within the Alameda West Portal site because of the high degree of disturbance.

No habitat for special-status wildlife species was observed in this area. A pasture below the fenceline may provide upland aestivation habitat for the California tiger salamander, a federal candidate species, but is considered marginal because there are no nearby breeding pools (with the exception of Alameda Creek) and few small mammal burrows in this area. Raptor foraging habitat occurs in the pasture below the site and in the surrounding area. Habitat on the steep, east-facing hillsides above the site may provide nesting habitat for special-status birds such as

loggerhead shrike, Cooper's hawk, golden eagle, and red-tail hawk, though nesting habitat for these or other special-status wildlife was not observed on or near the site. The wooded areas will not be modified by the proposed site improvements. Habitat for Alameda whipsnake does not occur on the project site, but may be present on the wooded slopes west of the site. These areas would not be disturbed by the proposed project.

Pulgas Site

- The description of special-status species in the Pulgas site area encompasses the dechloramination facility and contactor basin area, the contactor pipeline routes leading to the dechloramination facility and from the contractor basin, and areas to the west and northwest of project facilities (see Figure IV.C-1).

Most of the special-status plants considered in Appendix C (e.g., Marin dwarf flax [*Hesperolinon congestum*] and San Mateo thorn-mint [*Acanthomintha duttonii*]) that occur within the Peninsula Watershed require certain habitat conditions that are not present at the Pulgas site, such as serpentine soils, areas of low disturbance, or the presence of other plant species. Other species (e.g., San Francisco wallflower [*Erysimum franciscanum*] and Dudley's lousewort [*Pedicularia dudleyi*]) favor areas subject to disturbance events such as burns or mowing. Disking and other routine maintenance activities at the Pulgas site have caused disturbance that exceeds the requirements of species such as San Francisco wallflower and Dudley's lousewort. For this reason, no special-status plants are likely to occur at this site.

- Many nesting passerine bird species (protected by the Migratory Bird Treaty Act) and possibly nesting raptors (protected by the Migratory Bird Treaty Act and CDFG Code 3503.5) are expected at the Pulgas site during the nesting season (approximately March 1 through August 15).

- Special-status species are described below for the following locations: the proposed dechloramination facility and contactor basin site, the contactor pipeline routes, and adjacent areas. No other potential special-status wildlife species were identified for the Pulgas site.

- **Pulgas Dechloramination Facility and Contactor Basin.** This area consists of annual grasslands, with woodland habitat located to the north and east. The grasslands in this area contain few small mammal burrows (only pocket gopher burrows were noted) and little plant or wildlife diversity. No debris, snags, woodpiles, rockpiles, slash, or other types of cover were observed on this site. Based on these findings, the grasslands portion of the Pulgas dechloramination facility and contactor basin area does not appear to provide suitable habitat for San Francisco garter snake (*Thamnophis sirtalis tetrataenia*) or California red-legged frog (*Rana aurora draytonii*), the primary species of concern in the project region, although such a determination must be made with caution considering the known presence of the species in the area.

- **Contactor Pipeline Routes.** The proposed pipeline route between the Pulgas Water Temple and the proposed dechloramination facility site would cross an unnamed drainage that does provide potential San Francisco garter snake and California red-legged frog habitat (see Figure IV.C-1). A 4-foot by 3-foot pool suitable for California red-legged frog breeding was observed downstream from the proposed crossing area. It is anticipated that the associated oak woodland riparian habitat in this waterway could provide upland refugia for this species as well. The presence of aquatic habitat and suitable forage species suggests possible habitat for San Francisco garter snake, but habitat for this species is considered marginal compared with downstream areas because of the narrow width of the riparian corridor.

  Protected nesting birds, including several raptor species (e.g., northern harrier and red-tailed hawk), are expected to use the riparian woodlands north of the site during the breeding season.

- The area surrounding the Pulgas Water Temple consists of ornamental plants and is regularly maintained. None of the special-status plant species considered in Appendix C are expected in this area. The location of proposed pipeline construction at the Pulgas Water Temple includes both disturbed and landscaped areas, as well as upland wooded habitat to the south of the temple. The Pulgas Water Temple area does not provide year-around habitat for the federal and state endangered San Francisco garter snake or the federal threatened California red-legged frog, the primary species of concern in the project region, although such a determination must be made with caution considering the known presence of the species in the area.

- **Adjacent Areas.** Known breeding habitat for the California red-legged frog occurs at Laguna Creek, which is located west of the Pulgas site area, and potential upland refugia habitat occurs throughout the Pulgas site area (ESA, 1999). Potential upland aestivation habitat and basking areas for San Francisco garter snake occur in the marshy willow riparian habitats southwest of the overflow channel. The willow thickets have a nearly impenetrable shrub layer consisting of poison oak and California blackberry. The ground in the willow thicket appears to be persistently moist, though standing water was not observed during the fall site visits.

  In November 1998, ESA biologists observed a mature California red-legged frog 200-300 feet from Laguna Creek on the south side of the access road. Laguna Creek is a minor tributary drainage to Upper Crystal Springs Reservoir. The mature individual was in upland habitat, under a madrone shrub. A California red-sided garter snake, a subspecies of the common garter snake with similar habitat requirements as the San Francisco garter snake, was observed roughly 150 feet southwest of the overflow channel. This species was detected in a small opening in the willow canopy that allowed for basking. Though habitat has been poorly described for the San Francisco garter snake, based upon the described propensity of the snake and California red-legged frog to use adjacent upland habitats (USFWS, 1985; 1996; Jennings and Hayes, 1994), all identified willow riparian habitats in the Pulgas site area region are considered to meet habitat suitability standards for California red-legged frog and San Francisco garter snake.

- Upland habitat value for San Francisco garter snake and California red-legged frog depends principally upon the proximity to seasonal or perennial aquatic habitats; the availability of cover such as dense vegetation, leaf litter, or slash piles; and the availability of suitable food sources. Suitable habitat in the project area may include willow riparian habitat, grasslands, and wooded areas. Moderate- to high-quality upland habitat for San Francisco garter snake and California red-legged frog was identified in uplands and willow riparian habitats near the Pulgas site. Potential habitat was noted both south and west of the overflow channel. The identified willow riparian thicket becomes more dense further to the south and was also noted west of the overflow channel. Grasslands adjacent to the willows may also provide habitat for San Francisco garter snake and California red-legged frog. Based upon the little known upland distribution preferences of San Francisco garter snake (USFWS, 1985) and close proximity of this area to essential breeding habitat, the mixed oak woodlands habitat along the contactor pipeline routes should be considered at least marginally suitable for this species. While observed near the site, the California red-legged frog is not expected to use the annual grassland portion of the Pulgas dechloramination facility, contactor basin, and contactor pipeline areas because of the generally poor cover these areas provides, but is presumed to be present seasonally in all other areas.

  The willow riparian habitat also provides potential breeding habitat for the saltmarsh common yellowthroat, a federal and state species of concern. Breeding yellowthroat populations were identified in willow habitats near Upper Crystal Springs Reservoir within 600 feet of the proposed overflow channel area (CNDDB, 1999); however, willow thickets also occur within 50 feet of the proposed channel.

Pulgas Balancing Reservoir

The project site supports mostly ornamental landscape species within an industrial water facility. None of the special-status plant species considered in Appendix C are expected to occur at this project site.

No special-status wildlife species are expected to occur at the Pulgas Balancing Reservoir site. No wildlife species are expected to use the paved portions of the site, and few are expected to use the mowed road shoulder or ornamental areas. This site is south of Cañada Road and is not contiguous with nearby coastal oak woodland or grasslands habitat. This site is isolated from known or suspected California red-legged frog and San Francisco garter snake habitat and provides no habitat for these species. No other special-status wildlife species are expected at this site.

Harry W. Tracy Water Treatment Plant Site

Though occurrences of Marin dwarf flax and Crystal Springs lessingia (*Lessingia arachnoidea*) are reported within 1/4 mile of the Harry W. Tracy WTP project site (CNDDB, 1999), these species are not expected at either alternate location of this site. The project sites are highly disturbed and consist of species that would prevent the establishment of these special-status species (e.g., eucalyptus trees). Additionally, Marin dwarf flax and Crystal Springs lessingia are known to occur on serpentine soils. Serpentine soils are not present at the project site.

None of the special-status wildlife species considered in Appendix C are expected at the Harry W. Tracy project site. Both proposed construction areas at this site were dominated by nonnative vegetation such as English ivy, French broom, and eucalyptus and provide no habitat value for sensitive wildlife. The area surrounding the sites was similarly disturbed and would not provide source populations for special-status species. Nesting raptors were not observed and are not expected at either site due to the intensive nature of treatment plant activities.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for biological resource impacts, but it generally considers that implementation of the proposed project would have a significant effect on biological resources if it were to:

- have a substantial adverse effect on federally protected wetlands (including, but not limited to, marshes and riparian areas) as defined by Section 404 of the Clean Water Act, or riparian and marsh areas under the jurisdiction of CDFG, as defined by Fish and Game Code Sections 1601-1603;
- have a substantial adverse effect on any species identified as threatened, endangered, candidate, or sensitive (rare), as discussed in CEQA Guidelines Section 15380;
- have a substantial adverse effect on the habitat of endangered, threatened, or rare species, or other sensitive natural community identified in local or regional plans, policies, regulations, or by lists compiled by CDFG or USFWS; or
- substantially interfere with movement of any native resident or migratory fish or wildlife species, or with established fish or wildlife migratory or dispersal corridors.

2.2 IMPACTS

Summary of Impacts By Project Component

Table IV.C-4 provides a summary of the biological resource impacts associated with specific components of the proposed project and their respective level of significance.

Wetland Impacts

Potential jurisdictional wetlands and nonwetland water resources occur at several of the project sites. Under the current proposal, most of these wetland drainage features would be permanently recontoured and/or disturbed by leveling the ground to support the proposed facilities. These activities would displace and disturb the potential jurisdictional areas at these sites. The precise area of wetland impact is not known because a formal wetland delineation has not been performed. The approximate wetland areas at sites were determined based upon a preliminary field reconnaissance and are presented in Table IV.C-5.

Disturbances would occur to potentially jurisdictional wetlands as a result of permanent wetland fill at the Tesla Portal site, San Antonio Pump Station site, Alameda East Portal site, and Pulgas site. At the Pulgas site, disturbances would impact areas classified as wetlands, and a channel that is considered "other waters of the U.S." Direct impacts to the creek channel would be temporary, and permanent loss of wetlands or diminished habitat value would not be anticipated. Impacts from filling wetlands at the Pulgas site would be permanent and more extensive. Impacts at each site are discussed in more detail below.

Tesla Portal Site

A drainage (approximately 30 feet long by 10 feet wide) occurs on the eastern side of the project site. Species observed include rush, sedge (*Carex* sp.), rabbit-foot grass (*Polypogon monospeliensis*), and willowherb (*Epilobium* sp.). This drainage is potentially subject to Corps jurisdiction under Section 404 of the Clean Water Act and CDFG regulations. Disturbance to this area would be considered a potentially significant impact. Mitigation measures described in Section V.C recommend conducting a wetland delineation of this area by a qualified biologist to

TABLE IV.C-4
SUMMARY OF IMPACTS – BIOLOGICAL RESOURCES

		Sunol Valley Sites			Pulgas Sites			
Impact	**Tesla Portal Site**	**San Antonio Pump Station Site**	**Alameda East Portal Site**	**Alameda West Portal Site**	**Pulgas Site**	**Pulgas Balancing Reservoir Site**	**Harry W. Tracy WTP Site**	**Secondary Discharge Locations**
Wetland impacts	PSM	PSM	PSM	N/A	PSM	N/A	N/A	N/A
Special-status species impacts	PSM	N/A	N/A	PSM	SM /PSM	N/A	N/A	N/A
Common species impacts	LS	LS	LS	LS	LS	N/A	N/A	N/A
Tree impacts	N/A	N/A	N/A	N/A	LS	N/A	N/A	N/A
Aquatic habitat impacts	N/A	LS	LS	LS	LS	LS	PSM	LS
Nesting raptor and passerine bird impacts	N/A	PSM	PSM	PSM	PSM	N/A	N/A	N/A
Vegetation communities impacts	N/A	N/A	N/A	N/A	SM	N/A	N/A	N/A
Invasive landscape plant species impacts	N/A	N/A	N/A	N/A	PSM	N/A	N/A	N/A

SM = Significant Impact, can be Mitigated
LS = Less than Significant Impact
PSM = Potentially Significant Impact, can be Mitigated
SU = Significant Unavoidable Impact
B = Beneficial
N/A = Not Applicable

map and identify wetland acreage and to serve as a basis for permitting or avoidance. Implementation of this measure would assure regulatory compliance within protected wetlands and would reduce the impact to a less than significant level.

San Antonio Pump Station Site

Two drainages (each approximately 50 feet long by 10 feet wide) occur on the north and south sides of the project site. Arroyo willow dominates the northern drainage, and mule fat dominates the southern. During reconnaissance surveys on September 10, 1999, water was flowing through a 6-inch pipe in the northern drainage, and the soil was saturated in the southern drainage. A freshwater meadow (approximately 300 square feet in size), with saturated soils composed predominantly of rush and knotweed, occurs near the northern drainage. These areas may be subject to Corps jurisdiction under Section 404 of the Clean Water Act. Disturbance to this area

TABLE IV.C-5
ESTIMATES OF POTENTIAL JURISDICTIONAL WETLANDS AND OTHER WATERS OF THE UNITED STATES[a]

Site Name	Approximate Area	Location and Description of the Wetland Feature	
Tesla Portal Site	300 ft^2	Small drainage on the east side of the project site	Permanent impact
San Antonio Pump Station Site	1,300 ft^2	Two drainages: one on the north side of site, one on south side; freshwater meadow on north side of the site	Permanent impact
Alameda East Portal Site	60 ft^2	Narrow drainage on north side of site	Permanent impact
Pulgas Site	500 ft^2 (Temporary creek impact) <4,000 ft^2 (Permanent, may be nonjurisdictional)	Creek corridor in proposed pipeline route north of the site; shallow wet depressions in grasslands in the center of the site	Temporary and permanent impacts

a Estimates of potential jurisdictional features are based on an assessment of hydrologic and vegetative characteristics. These data should be considered preliminary pending a formal jurisdictional delineation and verification by the Corps.

SOURCE: ESA, 1999

would be considered a potentially significant impact. Mitigation measures described in Section V.C recommend conducting a wetland delineation of this area by a qualified biologist to map and identify wetland acreage and to serve as a basis for permitting or avoidance. Implementation of these measures would assure regulatory compliance within protected wetlands and would reduce the impact to a less than significant level.

Alameda East Portal Site

A narrow drainage (approximately 30 feet long by 2 feet wide) with predominant cattail vegetation occurs on the north side of the site and may be hydrologically connected with the northern drainage at the San Antonio Pump Station site. This wetland feature may result from discharges from the Alameda East discharge pipe, but is potentially subject to Corps jurisdiction under Section 404 of the Clean Water Act and CDFG regulations. Pending the results of a jurisdictional determination, disturbance to this area could be considered a potentially significant impact. Mitigation measures described in Section V.C recommend conducting a wetland delineation of this area by a qualified biologist to map and identify wetland acreage and to serve as a basis for permitting or avoidance. Implementation of these measures would assure regulatory compliance within protected wetlands and would reduce the impact to a less than significant level.

Pulgas Site

The grassland site was historically used for agriculture and is routinely disked. Hydrophytic vegetation such as creeping wildrye and Italian ryegrass was observed in the shallow depressions (area totaling less than 1/10 acre). These plants are not obligate wetland species and occasionally occur in nonwetland areas. Soils at this site were not saturated at the time of observation, though some areas with hydrophytic vegetation may be jurisdictional.

An unnamed creek occurs on the northwestern perimeter of this site (see Figure IV.C-1). Arroyo willow is the dominant species along the creek. Water was observed within the creek during ESA's September visit. Within the project site, the creek riparian corridor is approximately 400 feet long and 100 feet wide. The area of disturbance would be approximately 50 feet by 10 feet of Corps jurisdictional waters. This creek is subject to Corps jurisdiction under Section 404 of the Clean Water Act and CDFG regulations.

Disturbance to the creek and the grassland site would be considered a potentially significant impact. Mitigation measures described in Section V.C recommend conducting a wetland delineation of this area by a qualified biologist to map and identify wetland acreage and to serve as a basis for permitting or avoidance. Implementation of these measures would assure regulatory compliance within protected wetlands and would reduce the impact to a less than significant level.

Special-Status Species Impacts

Habitat for special-status plants and animals is present in woodland habitats, riparian areas, and annual grasslands in the project areas. Impacts to these species may include the temporary or permanent removal of habitat, direct mortality from equipment, entrapment in pipe sections or trenches, and harassment to special-status animals due to noise or vibration. The special-status species associated with habitats identified in and near the project sites include:

- California red-legged frog (federal threatened and California species of special concern)
- San Francisco garter snake (federal and California endangered)
- Alameda whipsnake (federal and California threatened)
- San Joaquin kit fox (federal endangered and California threatened)
- California tiger salamander (federal candidate for listing and California species of special concern)
- Burrowing owl (federal species of concern and California species of special concern)
- Saltmarsh common yellowthroat (federal species of concern and California species of special concern)
- Special-status bat species including pallid bat, greater western mastiff bat, small-footed myotis bat, long-eared myotis bat, fringed myotis bat, long-legged myotis bat, and Townsend's big-eared bat (all but pallid bats are federal species of concern; several are California species of special concern [see Tables IV.C-2 and IV.C-3])
- Western leatherwood (CNPS List 1B)

Minimal suitable habitat for special-status species is present at the San Antonio Pump Station, Alameda East Portal, Pulgas Balancing Reservoir, and Harry W. Tracy WTP sites. Therefore, no significant upland and wetland habitat special-status species impacts would occur at these sites. Potential impacts to nesting raptors and passerine birds at San Antonio Pump Station and Alameda East Portal sites are discussed below. The locations of specific impacts for each species are provided in Tables IV.C-2 and IV.C-3.

Tesla Portal Site

Temporary disturbance to nesting burrowing owl and San Joaquin kit fox could occur during the construction period if the single burrow detected on site were to become occupied or other burrows were to become available. No significant long-term loss of habitat for either species is anticipated. The Mt. Diablo foothills area west of the site provides sufficient nesting and denning habitat to accommodate any displaced burrowing owls or foxes. Potential direct impacts to burrowing owl and San Joaquin kit fox include harassment, injury, and/or mortality of individual adults and juveniles during construction. This includes the risk of incidental take from preconstruction surveys and potential relocation of individuals, crushing of individuals by heavy equipment, and disturbance to habitat from grading and filling activities. No potential impacts to special-status plant species were identified at this site.

The potential impact to special-status animals at the Tesla Portal site is considered to be potentially significant. In order to avoid potential impacts to burrowing owl and San Joaquin kit fox at the Tesla Portal site, several avoidance and mitigation measures should be applied. These include preconstruction surveys for burrowing owls and for San Joaquin kit fox, in accordance with accepted protocol, to determine site use. If occupied habitat for these species is detected on or adjacent to the site, measures to avoid, minimize, or mitigate impacts to these species should be incorporated into the project. Implementation of these mitigation measures, as listed in Section V.C, would avoid or minimize adverse effects to special-status species and would reduce potential impacts to a less than significant level.

Alameda West Portal Site

The Alameda West Portal site is presently fenced and provides no suitable habitat for Alameda whipsnake, California tiger salamander, or special-status plant species. However, construction activities could infringe upon the grazed pastureland east of the site. This area may provide upland aestivation habitat for the California tiger salamander. Impacts to California tiger salamander resulting from the project include the potential for destruction of individual salamanders, if present, and the loss of suitable aestivation habitat. This is a potentially significant impact. As described in Section V.C, preconstruction surveys should be completed for adult California tiger salamander and aestivation burrows that may occur within the project area and appropriate recommendations implemented. Implementation of the mitigation measures listed in Section V.C would avoid or minimize adverse effects to special-status species and would reduce the impact to less than significant.

Breeding habitat for the California tiger salamander may occur at nearby Alameda Creek and adjacent grasslands. Suitable breeding habitat at Alameda Creek may be indirectly impacted by increased erosion, accidental discharge of deleterious fluids, or incidental intrusion by construction workers or equipment. However, impacts to this species are limited because of the low-quality breeding habitat present in this area. Further, salamander breeding has not been documented nearby on the Sunol Valley floor.

Habitat for the Alameda whipsnake may occur in chaparral woodlands upslope from the project site, though the site and pasturelands are devoid of vegetation and provide no habitat for these species. The project site is essentially leveled, bare ground with 100 percent visibility of the ground surface. No small mammal burrows or other potential cover are available. Because of these unsuitable site characteristics, no "take" of Alameda whipsnake or its habitat are expected. Construction at the site would not affect any native chaparral habitat, woodland habitat, or rocky slopes that could support this species. Because construction would mostly be limited to the fenced and mowed site and a small area of pastureland, no significant impacts to Alameda whipsnake are anticipated.

Potential impacts to nesting raptors and passerine birds at this site are discussed below.

Pulgas Site

California Red-Legged Frog and San Francisco Garter Snake. Impacts to California red-legged frog and San Francisco garter snake may occur in the unnamed creek north of the site as a result of the proposed pipeline that would connect facilities at the Pulgas Water Temple to the dechloramination facility. This creek may provide upland aestivation habitat for California red-legged frog. The potential impacts associated with the creek crossing include habitat modification and the potential for mortality to individual frogs and/or snakes. The creek channel is rocky and not highly vegetated, with most riparian vegetation growing on banks and upland areas. Construction activities in the riparian habitat could affect upland-dispersing California red-legged frog between the time frogs disperse from drying areas (July) until those areas are recharged by winter rains and breeding begins (November). Construction could cause direct mortality of California red-legged frog and/or San Francisco garter snake if they were present in work areas. A potential California red-legged frog breeding pool was identified in the unnamed creek roughly 200 feet downstream from the proposed crossing area.

In addition, direct significant impacts to individual California red-legged frogs and San Francisco garter snakes and their habitat may occur during construction, as well as indirect impacts to habitat within and adjacent to the Pulgas site. The overflow channel is within 50 feet of willow riparian habitat that may support both species. Construction at the Pulgas site, specifically in areas near the overflow channel, could affect upland-dispersing California red-legged frog between the time frogs disperse from drying areas (July) until those areas are recharged by winter rains and breeding begins (November). Construction could cause direct mortality of California red-legged frog and/or San Francisco garter snake if they were present in work areas. Because the Pulgas site provides only upland habitat, no loss of California red-legged frog breeding habitat is expected as a result of this project component. However,

construction of the proposed dechloramination facilities at the Pulgas site would be considered a significant impact, unless appropriate mitigation measures are conducted. These measures include consultation with regulatory agencies and compliance with recommended measures, such as on-site biological monitoring, education of construction employees, and isolating the work area from entry by these species. Implementation of mitigation measures listed in Section V.C would avoid or minimize adverse effects to special-status species and would reduce the impact to less than significant.

Special-Status Bats. Impacts to special-status bat species resulting from the project include the potential for destruction of individual bats, if present, and the loss of suitable foraging and roosting habitat in large-diameter trees. Tree and vegetation removal in the unnamed creek are likely to be the most significant project impacts. To date, bat surveys have not been performed at the Pulgas site, though the species most likely to be affected by the proposed activities are the pallid bat, greater western mastiff bat, small-footed myotis bat, long-eared myotis bat, fringed myotis bat, long-legged myotis, and Townsend's big-eared bat. This is considered to be potentially significant but mitigable impact. Implementation of preconstruction surveys and avoidance measures, as listed in Section V.C of the mitigation measures chapter, would avoid or minimize adverse effects to special-status species and would reduce the impact to less than significant.

Although open grassland northwest of the Pulgas site provides potential habitat for several plant species, no potential impacts to special-status plant species were identified at the proposed site. Potential impacts to nesting raptors and passerine birds at this site are discussed below.

Common Plant and Animal Species

During the construction phase, the project could result in disturbance to, or direct mortality of, common plant and wildlife species. Direct impacts to wildlife species include both mortality of resident species and habitat loss and degradation. Mortality would include road kills, destruction of burrows of such species as ground squirrels and gophers, and destruction of nests of species such as western meadowlarks. Temporary construction-related disturbances could include displacement of animals due to construction noise and loss of habitat. Such habitat losses could be permanent for certain fossorial mammals, whose populations could be locally reduced due to habitat modification. Direct impacts to common plant species include mortality to plants and disturbance to below-ground seed banks due to construction activities.

Direct impacts to common plant and wildlife species and loss of habitat could occur at all project sites, with the exception of the Harry W. Tracy WTP site and Pulgas Balancing Reservoir site. These construction and operations-related disturbances to common wildlife would be considered adverse to common plant and animal species but not significant under the CEQA significance criteria. Therefore, these impacts would be less than significant.

Tree Impacts

- Only nonprotected ornamental trees were identified at the Tesla Portal site in San Joaquin County and the Pulgas Balancing Reservoir and Harry W. Tracy WTP sites in San Mateo County. Alameda County protects heritage trees; however, the Sunol Valley project sites are outside of the Alameda *East County Area Plan* sphere of influence (County of Alameda, 1993). No protections are afforded to trees that occur at these sites. Trees at the Pulgas site include cork oak orchard near the Pulgas Water Temple (roughly 10 to 15 trees would be removed), a row of redwood trees growing near the overflow channel (approximately 20 trees would be removed), and large coast live oak trees at the Pulgas site (roughly 10 to 20 trees would be removed). In addition, approximately 10 Lombardy poplars and 25 unidentified ornamental trees (*Prunus* sp.) would be removed at the Pulgas site to accommodate the project. These trees have not been identified as a sensitive natural community in local or regional plans, or by lists compiled by CDFG or USFWS. Therefore, removal of trees at the Pulgas site would be considered less than significant.

Aquatic Habitat Impacts

If the proposed project is implemented, controlled, uncontrolled, and accidental discharges of chlorinated or chloraminated water into natural water bodies could occur at Alameda Creek, Upper Crystal Springs Reservoir, and San Andreas Reservoir, as well as at other minor drainages. Discharges of chlorinated water would also continue at San Antonio Reservoir and San Antonio Creek. General water quality impacts related to chlorine, chloramine, and ammonia toxicity and to nitrogen loading and algal stimulation are discussed in detail in Section IV.D, Hydrology and Water Quality. Impacts to aquatic habitat as they relate to these water bodies are discussed below.

Alameda Creek

With implementation of the proposed project, Alameda Creek could receive both chlorinated and chloraminated water discharges. Discharges could originate from Alameda East Portal, Alameda West Portal, and the proposed facility at the San Antonio Pump Station.

Uncontrolled, automatic discharges of chlorinated water would continue to be discharged from Alameda East Portal to Alameda Creek, as presently occurs under existing conditions. Discharges greater than 1 million gallons are estimated to occur weekly. Currently, there is a temporary dechlorination facility at Alameda East Portal that is used to remove chlorine from the water before it is discharged to the creek. Under the proposed project, there would be a permanent dechlorination facility constructed at this site to remove chlorine from the overflows. The proposed project would therefore provide increased reliability and protection of Alameda Creek aquatic habitat compared to existing conditions. Overflows from Alameda East Portal to Alameda Creek would be a less than significant impact.

Similarly, there may continue to be automatic, uncontrolled discharges at the Alameda West Portal, which occur less frequently and at lower volumes than those at Alameda East Portal. However, with the proposed project, the overflow from the Alameda West Portal would be

chloraminated instead of chlorinated water. The proposed project calls for either construction of a permanent dechlorination facility at Alameda West Portal, if determined necessary by the volume and frequency of overflows, or use of a temporary dechlorination facility at this location. Under either scenario, chlorine would be removed from the water prior to discharge to Alameda Creek, but some residual ammonia would remain. As discussed in Section IV.D, Hydrology and Water Quality, ammonia would be present at less than toxic levels and within Basin Plan requirements for protection of aquatic organisms. In addition, based on the low frequency and volume of discharge from Alameda West Portal, the level of ammonia would not be expected to result in algal stimulation. Alameda Creek is an intermittent stream that provides aquatic habitat during the winter, spring, and late-fall seasons. Algal growth during these periods is typically very limited due to low ambient winter temperatures and reduced sunlight. Algal stimulation is even less likely given the short period of time that the creek contains water. During the summer and early fall, when Alameda Creek is dry, there is no aquatic habitat of concern. Therefore, overflows from Alameda West Portal to Alameda Creek would be a less than significant impact.

Under normal operating conditions, the proposed ammonia feed and chlorine trim facility at the San Antonio Pump Station would not result in any discharges or overflows to Alameda Creek. Therefore, this would be a less than significant impact. Discharges from the proposed facility could occur only in the event of accidental spills or a catastrophic system breakdown or pipe failure. As discussed in Section IV.I, Hazardous Materials, impacts associated with accidental spills would be mitigated to less than significant through secondary containment and other design provisions included in the proposed project. While not directly related to the proposed project, any catastrophic event would need to be monitored, such as through the System Controls and Data Acquisition projects (see Section VI.B.1.0, Related Projects and Plans), and responded to on a systemwide basis, such as by deploying emergency shutoff valves, redirecting water flows, or discontinuing the ammonia and chlorine feed systems.

San Antonio Reservoir

The San Antonio Pump Station is used to pump water from the San Antonio Reservoir to the Sunol Valley WTP or to Calaveras Reservoir. It can also be used to pump Hetch Hetchy water to the Sunol Valley WTP or to San Antonio Reservoir or San Antonio Creek. The pump station can pump 160 million gallons per day to San Antonio Reservoir and, with some gravity flow, can pump 260 million gallons per day to San Antonio Creek. Dechlorination facilities at the San Antonio Pump Station are used to remove chlorine from Hetch Hetchy water in the event that chlorinated water is discharged from the pump station to either San Antonio Creek or San Antonio Reservoir.

Under normal operating conditions, San Antonio Reservoir and San Antonio Creek would not receive any chloraminated water. The point at which water transfers to the reservoir occur is upstream of the proposed ammonia and chlorine feed system in the Sunol Valley. There would be no impacts to aquatic habitats in San Antonio Reservoir or Creek from the proposed project.

Upper Crystal Springs Reservoir

Upper Crystal Springs Reservoir receives a blend of Hetch Hetchy and treated Alameda Watershed water that is conveyed through the Bay Division Pipelines. Upper Crystal Springs Reservoir is linked directly to Lower Crystal Springs Reservoir, and water from both is transferred into San Andreas Reservoir. Currently, this water is chlorinated at the Tesla Portal; under the proposed project, the water would be chloraminated by adding ammonia at the proposed San Antonio Pump Station. To protect the water quality and aquatic habitat of Crystal Springs Reservoir, the proposed project would remove all chlorine from the water and would reduce levels of ammonia. The proposed chlorine residual would be zero, which would improve water quality for aquatic habitat and constitute a beneficial impact of the project. The proposed dechloramination facility would reduce ammonia levels, which would protect aquatic life from ammonia toxicity as well as prevent algal stimulation (see Section IV.D, Hydrology and Water Quality, for further discussion of water quality effects). Therefore, this impact would be less than significant.

San Andreas Reservoir

San Andreas Reservoir receives water transferred from Crystal Springs Reservoir as well as various overflows from the Harry W. Tracy WTP. The proposed dechloramination of water discharged to Upper Crystal Springs Reservoir, discussed above, would also mitigate any impacts to San Andreas Reservoir. At the Harry W. Tracy WTP, the proposed project would include chlorine and ammonia feed facilities as well as a permanent dechlorination facility. Under certain operating conditions, treated water is discharged back to San Andreas Reservoir at overflow locations at the WTP. The frequency and volume of these overflows are currently not known. However, in order to comply with Basin Plan requirements and protect aquatic habitat at San Andreas Reservoir, the proposed project would include dechlorination facilities to remove chlorine from these overflows. The dechlorinated overflows, however, would still contain residual ammonia from the chloramination process. The volume of discharge and level of residual ammonia are not anticipated to be sufficient to promote algal stimulation. To assure that overflows of ammoniated water from Harry W. Tracy WTP to San Andreas Reservoir do not promote algal stimulation, mitigation measures are recommended for nutrient management and overflow and reservoir water quality monitoring, as described in Section IV.D and listed in Section V.C. Implementation of these mitigation measures would reduce potential impacts to the aquatic habitat and the water quality in San Andreas Reservoir to less than significant.

Other Minor Drainages

At secondary discharge locations, additional drainages such as Cordilleras Creek could be affected by overflows of chloraminated water. These drainages are discussed in Section IV.D, Hydrology and Water Quality, and are listed in Table IV.D-2. At all of these locations, the SFPUC proposes either to construct permanent dechlorination facilities or to use temporary dechlorination facilities to remove all chlorine from the overflows. Levels of residual ammonia would not be toxic (see Section IV.D), and due to the infrequent and limited volume of these discharges, levels of ammonia are not anticipated to result in algal stimulation. Therefore,

overflows to other drainages from secondary discharges would not be expected to affect aquatic resources. This impact would be less than significant.

Nesting Raptor and Passerine Bird Impacts

Breeding habitat for species protected under the Migratory Bird Treaty Act and Section 3503.5 occurs in or near the following sites: San Antonio Pump Station, Alameda East Portal, Alameda West Portal, and the Pulgas site. Potential nesting habitat for the saltmarsh common yellowthroat was identified in or near the Pulgas site. Potential breeding habitat for burrowing owl was identified at the Tesla Portal site and is discussed under the heading "Special-Status Species Impacts," above.

Construction activities at several sites could disturb nesting raptors or passerines during the breeding season (the period within which courtship, incubation, fledgling, and dependent local young may be found). The breeding season for most species occurs between March 1 and August 15. Construction activities during this period, including tree and brush removal, could result in abandonment of the nest and young, or nest destruction, thus causing mortality of the young and potentially reducing population numbers. Post-construction site maintenance and facilities operations (e.g., driving on maintenance roads) are not expected to have a significant adverse effect upon nesting passerines and raptors, because habitat loss or disturbances are not generally associated with maintenance activities. Post-project disturbances from motor vehicles and foot traffic are expected to be minimal. Impacts during construction at the above-identified sites could adversely affect habitat of protected species and are therefore considered potentially significant. However, mitigation measures to avoid these habitats during the nesting season, as listed in Section V.C, would protect nesting raptors and passerine birds, and implementation of these measures would reduce the impact to less than significant.

Vegetation Community Impacts

The CDFG has jurisdiction over vegetation removal within significant plant communities, such as willow riparian habitat. Thus, the removal of willow riparian vegetation at the Pulgas site would be subject to CDFG regulation. The approximate acreage of willow riparian habitat types is 500 square feet of combined coast live oak woodland and willow riparian habitat (see Figure IV.C-1). The removal of willow riparian habitat constitutes a substantial, adverse change in the physical conditions within the project area (CEQA Section 15382) and therefore would be considered a significant impact. However, mitigation measures listed in Section V.C to provide replacement habitat and to implement a revegetation plan would reduce the impact to less than significant.

Invasive Landscape Plant Species Impacts

Landscaping species have not been specified for the Pulgas site, but, if used, invasive plant species could reduce native species in this area and consequently have an adverse effect on habitat for listed species or sensitive natural communities (e.g., willow riparian habitat). The establishment of a viable population of invasive species in the ecologically sensitive Pulgas site area could alter the composition, diversity, and richness of wildlife and plant communities in the

adjacent areas and would constitute a potentially significant impact under CEQA. Mitigation measures to remove invasive plant species and to revegetate with native species, as listed in Section V.C, would reduce potential impacts to less than significant.

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D. HYDROLOGY AND WATER QUALITY

The Initial Study for this project evaluated the potential water quality and hydrologic impacts associated with construction and operation of project-related facilities (see Appendix A). The Initial Study determined that the project would have a less than significant water quality impact associated with wastewater, combined sewer overflows, and nonpoint-source discharges. Therefore, this EIR does not include further discussion of these water quality concerns. However, the Initial Study determined that potential water quality and hydrologic impacts could result from construction-related activities, as well as from discharges to Crystal Springs Reservoir and secondary discharge locations. Therefore, this section evaluates potential water quality and hydrologic impacts at the four facility locations as well as systemwide water quality impacts.

1.0 SETTING

The proposed project components would be located in several major watersheds within and near the San Francisco Bay Area. These watersheds support substantial beneficial uses, both for wildlife and people, where sustaining water quality is an important objective. Major project activities would occur in the regional watersheds of the Peninsula, upper Alameda Creek, and Corral Hollow Creek. The Peninsula Watershed is a general descriptive term for the SFPUC-owned watershed land within San Mateo County. This area encompasses all SFPUC lands managed for the protection and use of water stored in the Peninsula reservoirs, which includes Upper and Lower Crystal Springs Reservoirs, San Andreas Reservoir, and Pilarcitos Reservoir. The upper Alameda Creek watershed comprises the upper reach of Alameda Creek and Calaveras and San Antonio Reservoirs and is partly located within SFPUC-owned watershed land in Alameda and Santa Clara Counties known as the Alameda Watershed. Project activities would be concentrated in the watershed of upper Alameda Creek on SFPUC land. Additionally, a project component is located in the Corral Hollow Creek watershed on the eastern flank of the Coast Ranges in San Joaquin County.

1.1 CORRAL HOLLOW WATERSHED

The Hetch Hetchy Aqueduct runs through the Corral Hollow Creek watershed, a foothill watershed along the eastern flank of the central Coast Ranges near Tracy. This watershed is within the overall Old River watershed but is hydraulically divided from the overall watershed by I-580, the California Aqueduct, and the Delta-Mendota Canal. Surface drainages in the Corral Hollow Creek watershed are not well defined due to limited precipitation.

Tesla Portal Site

The Tesla Portal site is located in the Corral Hollow Creek watershed south of Corral Hollow Creek, where the Hetch Hetchy Aqueduct enters the Coast Range Tunnel. An unnamed ephemeral creek flows northeast approximately 3,000 feet from the Tesla Portal. This minor creek drains a relatively small subdrainage of the eastern North Ridge Mountains and discharges

minimal surface runoff to the lower valley area immediately downslope between the California Aqueduct and the Delta-Mendota Canal. A second, even smaller ephemeral creek drains the hills directly above the portal and passes to the southwest of the project site, but any distinct channel fades where the drainage flows into the rangeland immediately below the project site. No surface runoff from the Tesla Portal site or the surrounding area contribute water to the aqueduct or canal or directly to Corral Hollow Creek.

The area surrounding Tesla Portal consists of alluvial fans and fan terraces along Hospital, Lonetree, and Corral Hollow Creeks that coalesce to form one vast alluvial plain (SCS, 1988). The dominant slope is towards the northeast. The mountains of the Coast Ranges are undulating to very steep and have been uplifted and dissected. The climate of the area is characterized by hot, dry summers and cool, moist winters. The local area averages 9 to 11 inches of precipitation per year. The 100-year, 6-hour precipitation interval estimate is 2.0 inches (Western Regional Climate Center, 1999). Due to the undeveloped nature of the area, soil types (well-drained loams), limited precipitation and intensity, and the condition of the rangeland, there is only minimal surface runoff, and most of the precipitation infiltrates to the subsurface.

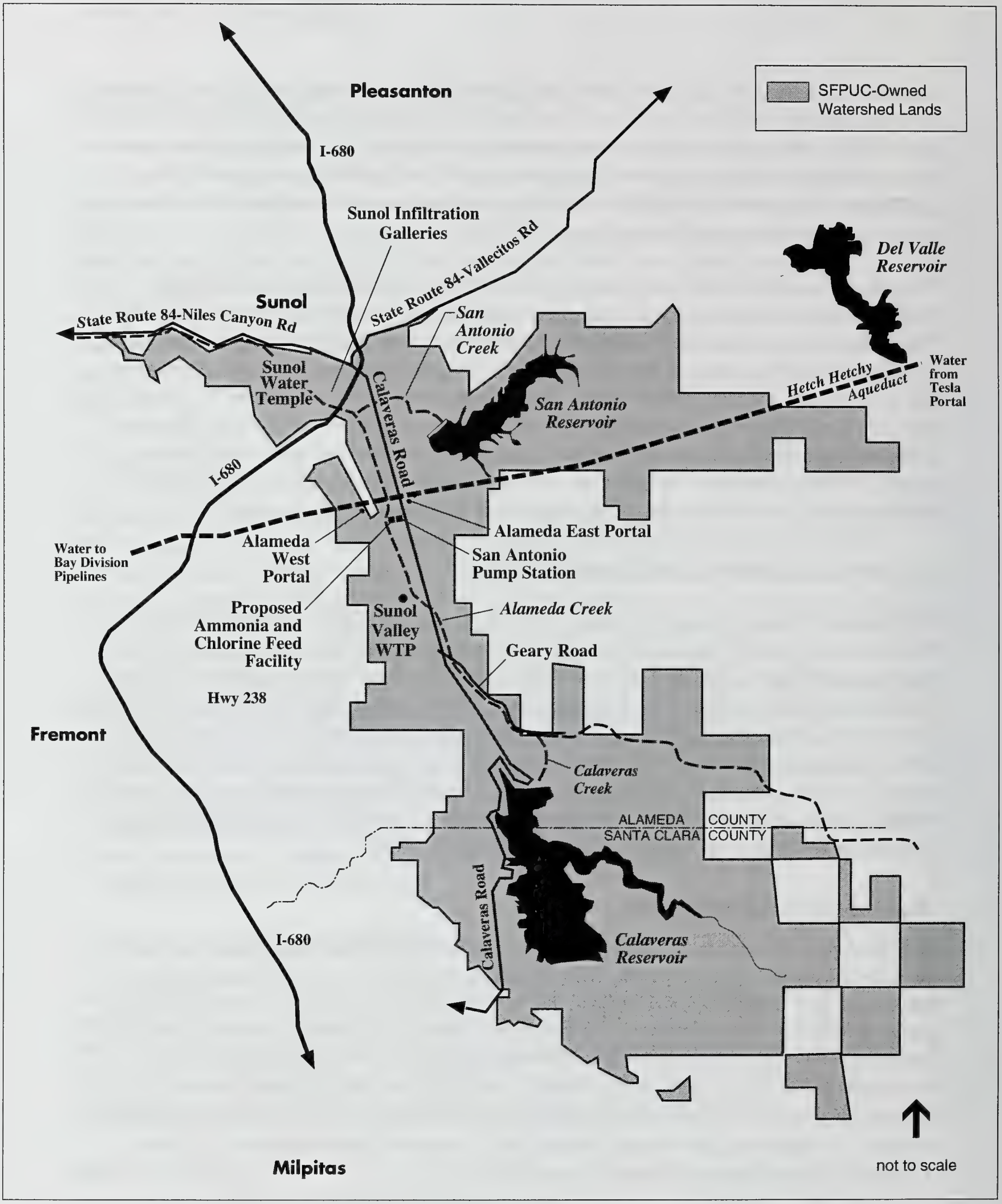
1.2 UPPER ALAMEDA CREEK WATERSHED

The Alameda Watershed lands are located in the upper Alameda Creek watershed within the Diablo Range portion of the central Coast Ranges in Alameda and Santa Clara Counties. The upper Alameda Creek watershed consists of three separate natural hydrologic drainage basins: (1) Calaveras Reservoir and upper Alameda Creek; (2) San Antonio Reservoir and San Antonio Creek; and (3) Alameda Creek from Calaveras Reservoir through Sunol Valley. The SFPUC lands in the upper Alameda Creek watershed drain to Sunol Valley, a gravel-filled depression of about 1,300 acres. Figure IV.D-1 shows the upper Alameda Creek watershed area, including the tributary creeks and major diversion and storage facilities. Annual average precipitation across this area ranges from 20 to 31 inches (Uribe & Associates, 1994).

San Antonio Pump Station Site

The San Antonio Pump Station site is adjacent to and on the east side of Alameda Creek within the upper Alameda Creek watershed, below Calaveras Reservoir. Calaveras Reservoir receives flows from upper Alameda Creek through the Alameda Diversion Dam and Tunnel. In normal years, the majority of the Alameda Creek streamflow above the Alameda Diversion Dam and Tunnel is diverted to and stored in Calaveras Reservoir, while downstream Alameda Creek streamflow below the diversion dam is limited. Alameda Creek near the pump station is an intermittent stream with no streamflow during summer months. The average annual rainfall in the area is approximately 20 inches. The 100-year, 6-hour precipitation frequency is 3.0 to 3.5 inches (Western Regional Climate Center, 1999).

Below the diversion dam, Alameda Creek conveys runoff from tributary drainages in the Diablo Range and Livermore Valley. In the general project area, Alameda Creek receives inflows from Calaveras Creek and Arroyo Hondo downstream of Calaveras Reservoir, and flows from San Antonio Creek downstream of San Antonio Reservoir.



SOURCE: EDAW, Inc., 1998; Environmental Science Associates, 2000

Figure IV.D-1
SFPUC Alameda Watershed

The San Antonio Pump Station is used to convey water from San Antonio Reservoir to the Sunol Valley WTP further upstream on Alameda Creek. In addition to storing local runoff, San Antonio Reservoir is used to store Calaveras Reservoir surplus water, Hetch Hetchy water, and South Bay Aqueduct emergency water. The proposed project would not affect water stored in San Antonio Reservoir, since all diversions to the reservoir are upstream of proposed chloramination facilities. Chlorinated Hetch Hetchy water that is currently pumped to San Antonio Reservoir or San Antonio Creek through the San Antonio Pump Station is dechlorinated and would not receive ammonia prior to discharge.

Numerous public and private roads cross the Alameda Creek floodplain in the vicinity of the San Antonio Pump Station and affect the natural flow of runoff. From the San Antonio Pump Station, the Hetch Hetchy Aqueduct passes under Alameda Creek from east to west. The Alameda East Portal is immediately east of the pump station along the aqueduct; the Alameda West Portal is west of the pump station along the aqueduct and across the Alameda Creek floodplain. Within the creek channel, the aqueduct pipelines have been exposed by bed scour. SFPUC personnel have placed protective gabions and cement around the exposed portions of the pipelines to protect them from breakage due to streamflow pressures. Commercial gravel mining is currently taking place immediately downstream of the San Antonio Pump Station within this drainage basin.

Flooding

The San Antonio Pump Station site is outside of the 500-year floodplain of the nearby Alameda Creek (FEMA, 1981). The creek is leveed along this stretch, which prevents an extensive floodplain through the area. Personnel at the San Antonio Pump Station have indicated that the location of the proposed ammonia feed and chlorine trim facility becomes saturated during winter and spring months, likely due to surface runoff (ESA, 1999). The proposed location is a low spot within the local topography, which is a likely cause of this noticeable soil saturation.

The San Antonio Pump Station borders the predicted inundation area of a catastrophic release of water from Calaveras Reservoir due to dam failure (OES, 1999). Inundation of the surrounding area would occur within the first hour after dam failure. The pump station is located along the periphery of the inundation area and would receive limited flooding, as would the proposed project site.

Water Quality

Alameda Creek water quality was tested as part of the *Alameda Creek Water Resources Study* (SFWD, 1995). Water quality testing indicated that the quality of Alameda Creek water is acceptable for establishing a trout population. Water temperature, dissolved oxygen, pH, hydrogen sulfide, copper, iron, and manganese in Alameda Creek surface water were all within U. S. Environmental Protection Agency (USEPA) water quality criteria for the protection of aquatic life. As discussed in Section IV.C, Biological Resources, Alameda Creek supports limited salmonid habitat, and, during wet years, some steelhead trout attempt to migrate up Alameda Creek.

Groundwater

The Sunol Valley has substantial alluvial deposits but has limited groundwater resources. The potential water-bearing geologic units consist primarily of alluvium and Livermore Gravels. The alluvium contains relatively large volumes of groundwater compared to any of the other geologic units in the area, though the total amount is not substantial. In the Sunol Valley, the alluvium is located along stream channels to depths of about 60 feet and is composed of coarse sand and gravel deposits with high permeability (SFWD, 1995). Typically located below the alluvium, the Livermore Gravels are found in the Livermore Valley and Sunol Valley to depths of at least 500 feet, although this geologic unit has been shown to contain limited groundwater.

Groundwater development in the Sunol Valley has been limited to historical operation of the Sunol Infiltration Galleries within the shallow alluvium and to the shallow dewatering wells associated with gravel-mining operations, both of which are located along Alameda Creek downstream of the San Antonio Pump Station. Data from about 18 existing monitoring wells in the Sunol Valley indicated that shallow groundwater levels in the alluvium are typically 20 to 30 feet below the ground surface, and groundwater flow is parallel to Alameda Creek (SFWD, 1993). There are two production wells in the valley that extend into the Livermore Gravels. One well is used for small-capacity nursery irrigation, and the other well was formerly used for plant process water by one of the mining operators. Past groundwater quality testing indicated that the groundwater generally meets primary drinking water standards, although there are locally elevated nitrate concentrations in the groundwater in the vicinity of historical farming in the area (SFWD, 1993).

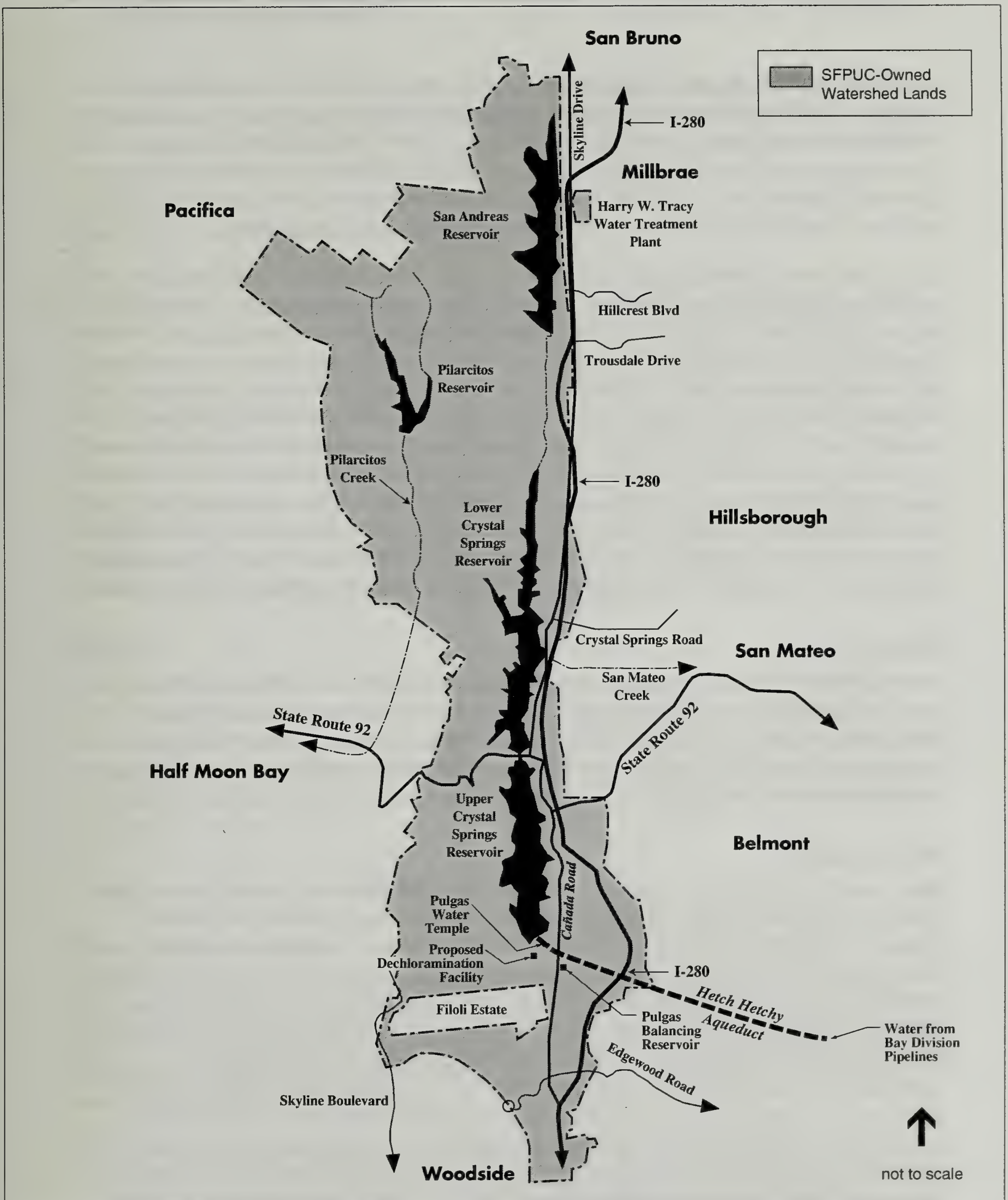
1.3 PENINSULA WATERSHED

The Pulgas site is within the 23,000-acre Peninsula Watershed. The Harry W. Tracy WTP site is adjacent to the watershed and is east of I-280. The Peninsula Watershed includes three water storage reservoirs: (1) Upper and Lower Crystal Springs Reservoirs; (2) Pilarcitos Reservoir; and (3) San Andreas Reservoir. The Pulgas site is adjacent to Upper Crystal Springs Reservoir, and the Harry W. Tracy WTP is adjacent to the San Andreas Reservoir. Figure IV.D-2 shows the Peninsula Watershed, including the tributary creeks, major diversions, and storage facilities.

In addition to local runoff originating within the Peninsula Watershed, water stored in the San Andreas and Crystal Springs Reservoirs includes water originating from the Hetch Hetchy system that is blended with treated water from the Alameda Watershed. This water is conveyed through the Bay Division Pipelines to Peninsula reservoirs by way of the Pulgas Water Temple. Runoff within the Peninsula Watershed provides about 3 percent of the total SFPUC water supply. Groundwater is not drawn from the underlying aquifer within the Peninsula Watershed.

Pulgas Site

The Pulgas site is located in the southeastern portion of the Peninsula Watershed within the Upper Crystal Springs Reservoir catchment area. Upper and Lower Crystal Springs Reservoirs are connected through a culvert beneath State Route 92, so there is free exchange between the two reservoirs. The combined Crystal Springs Reservoir has a catchment area of 22.5 square



SOURCE: EDAW, Inc., 1998; Environmental Science Associates, 2000

1998.898E: Hetch Hetchy Water Treatment Chloramine Conversion Project EIR / 990095

Figure IV.D-2
SFPUC Peninsula Watershed

miles, with 13.5 and 9 square miles in the drainages of the Upper and Lower Crystal Springs Reservoirs, respectively. The Crystal Springs Pump Station and Crystal Springs–San Andreas Pipeline are used to transfer water from Crystal Springs Reservoir to San Andreas Reservoir. The average annual rainfall in the vicinity of Upper and Lower Crystal Springs Reservoirs is 29.6 and 27.0 inches per year, respectively. The precipitation estimate for the 100-year, 6-hour recurrence interval is 4.0 to 4.5 inches (Western Regional Climate Center, 1999).

The combined Crystal Springs Reservoir has a capacity of 69,320 acre-feet (ac-ft). Future projects proposed for the dam, including the Lower Crystal Springs Dam Abutment Protection Project, could restore the historic capacity of the reservoir (see Section VI.B, Summary of Cumulative Environmental Effects). The Pulgas Water Temple is approximately 1/4 mile from the southern shoreline of Upper Crystal Springs Reservoir. The Lower Crystal Springs Dam Abutment Protection Project would increase the shoreline perimeter and would reduce this distance from the temple to the reservoir shoreline by an unknown amount. Currently, the lowest approximate elevation of the proposed Pulgas Dechloramination Facility site is 315.5 feet above mean sea level (SFPUC, 1999), and the current spillway elevation of Crystal Springs Dam is 284 feet above mean sea level (USGS, 1991). The surface gradient from this project location is to the west and south towards the reservoir, and runoff generally follows this same pattern when not impeded by obstructions, such as the paved parking lot or the Pulgas Water Temple facilities.

Flooding

The Pulgas project area is within Zone D of the National Flood Insurance Program's Flood Insurance Rate Map system. Zone D consists of areas of undetermined but possible flood hazards (FEMA, 1984). The proposed location of the Pulgas dechloramination facility is not susceptible to general flood hazards, and restoration of the historic capacity of Crystal Springs Reservoir would not affect the site.

Water Quality

Water stored in the Peninsula reservoir system originates from numerous sources, including local Peninsula Watershed drainage, treated Alameda Watershed drainage, and the Hetch Hetchy system. Oxygen-depleted conditions are periodically present in the lower depths of Lower Crystal Springs Reservoir during the late summer period due to natural decomposition of organic material. Low dissolved oxygen conditions cause nutrients to be released from sediments and deposited into the water column under normal conditions. The released nutrients stimulate algae growth, which can lead to increased particulates and higher turbidities and contribute to occasional taste and odor changes. San Andreas Reservoir itself is relatively shallow and well mixed, and an abundance of oxygen is generally present at all depths. However, water from Lower Crystal Springs Reservoir is normally transferred into San Andreas Reservoir, where increased algae and turbidities can cause undesirable loadings at the filtration plant. Increased runoff from winter storms can also cause elevated turbidity in the Peninsula reservoirs. Water quality studies suggest that the San Andreas and Crystal Springs Reservoirs are nitrogen-dependent for growth of aquatic vegetation, including algae (SFPUC, 1999). Studies are also currently being conducted to better establish the nitrogen sensitivity of the reservoirs and the

influence of phosphorus on algal stimulation. Currently, the proposed design of the dechloramination facility calls for 90 percent removal of the ammonia residual, but this removal rate may change, depending on the results of future studies concerning nitrogen and phosphorus influence on algal stimulation (SFWT, 2000).

Harry W. Tracy Water Treatment Plant

The northern end of the Peninsula Watershed, above the San Andreas Dam, comprises the drainage basin for San Andreas Reservoir. The Harry W. Tracy WTP is located outside of the reservoir's natural catchment area, but the WTP discharges stormwater runoff and filter backwash to the reservoir. In addition, during plant upsets or other treatment problems that may occur two to four times a year, the treated water reservoirs at the WTP are isolated from the system, and the treated water is dechlorinated and allowed to overflow to San Andreas Reservoir. The catchment area of the reservoir is 4.4 square miles, and the reservoir's capacity is 19,000 acre-feet. The average annual rainfall in the vicinity of San Andreas Reservoir and the Harry W. Tracy WTP is 34.8 inches per year. The 100-year, 6-hour precipitation recurrence interval is estimated to be 3.5 to 4.0 inches (Western Regional Climate Center, 1999). Outflow from the San Andreas Reservoir is pumped from two outlets to the Harry W. Tracy WTP for treatment, before distribution to customers via the San Andreas Pipeline.

Flooding

The Harry W. Tracy WTP is not located in a floodplain and has not experienced substantial flooding during the lifetime of the treatment plant. The storm drain system surrounding the administration and treatment buildings, which includes the location of the proposed chlorine and ammonia feed facilities, discharges collected stormwater runoff from roadways and buildings to San Andreas Reservoir. Natural areas of the Harry W. Tracy WTP drain to the east, away from San Andreas Reservoir.

1.4 REGULATORY FRAMEWORK

Water Quality Regulation

Water quality in California is controlled by regulatory authorities at both the state and federal levels. The USEPA is the federal agency, governed by the Clean Water Act, responsible for water quality management. An EPA regional office (EPA Region IX) is located in San Francisco and essentially delegates authority for water quality permitting to the State Water Resources Control Board (SWRCB).

The SWRCB, located in Sacramento, is the agency with jurisdiction over water quality issues in California. The SWRCB is governed by the Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code), which establishes the legal framework for water quality control activities by the SWRCB. Much of the implementation of the SWRCB's responsibilities is delegated to nine Regional Water Quality Control Boards (see also Section III.J, Required Permits and Approvals).

Regional Water Quality Control Boards

The San Francisco Bay Area Regional Water Quality Control Board (Regional Board or RWQCB) is responsible for protection of the beneficial uses of San Francisco Bay Area water resources, including water bodies in the vicinity of the Sunol Valley, Pulgas, and Harry W. Tracy WTP project sites. The Central Valley RWQCB has jurisdiction over the water resources in the vicinity of the Tesla Portal. However, due to the minor drainages and minimal surface water issues in the project area, water quality issues at the Tesla Portal, as discussed below under the heading "Impacts," are not anticipated. Therefore, this regulatory discussion focuses on water quality regulation in the San Francisco Bay region.

The San Francisco Bay Area RWQCB adopted the *Water Quality Control Plan* (Basin Plan) to implement plans, policies, and other provisions for water quality management as stipulated under the Porter-Cologne Water Quality Control Act. The most recent revision of the Basin Plan was adopted in June 1995 and was approved by the SWRCB in November 1995.

State policy for water quality control in California is directed toward achieving the highest water quality consistent with the maximum benefit to the people of the state. Aquatic ecosystems and underground aquifers provide many benefits to Californians. For this reason, water resources are designated with beneficial uses to define the ultimate goals for the resources, services, and qualities of these aquatic systems in order to protect and achieve high water quality. The RWQCB is charged with protecting these uses from pollution and nuisance that may occur as a result of water discharges in the region. Beneficial uses of surface waters, groundwaters, marshes, and mudflats serve as a basis for establishing water quality objectives and discharge prohibitions to attain beneficial use goals. Table IV.D-1 lists the beneficial uses for Alameda Creek, Upper and Lower Crystal Springs Reservoirs, and San Andreas Reservoir, as defined in the Basin Plan. The beneficial uses of the water bodies generally apply to all tributaries.

The Basin Plan also establishes both numerical and narrative objectives for water quality for local surface water bodies specific to the Bay Area to protect and maintain aquatic resources. Any discharges to surface waters in the region are subject to the RWQCB regulatory standards set forth in the Basin Plan. All discharges associated with the proposed project would be in compliance with RWQCB and Basin Plan requirements.

Basin Plan Constituents of Concern

As part of the proposed project, chlorine and ammonia would be injected into the SFPUC water system to disinfect the drinking water supply. Discharge of these constituents to the environment, however, is regulated under the Basin Plan by the RWQCB, due to potential toxic effects of chlorine and ammonia to aquatic organisms. The Basin Plan establishes water quality objectives as well as discharge limitations for all surface waters within the region to protect and maintain aquatic ecosystems. Numerical water quality objectives are designed to represent the maximum amount of pollutants that can remain in the ambient surface water body without causing adverse effects on aquatic organisms, on people consuming those organisms, or on other identified beneficial uses of the water body.

TABLE IV.D-1
DEFINITIONS OF BENEFICIAL USES OF SURFACE WATERS IN THE PROJECT AREA

Beneficial Use and Applicable Water Bodies	Description
Cold Freshwater Habitat (COLD) - Alameda Creek - Upper and Lower Crystal Springs Reservoirs - San Andreas Reservoir	Uses of water that support cold water ecosystems, including the preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife including invertebrates.
Groundwater Recharge (GWR) - Alameda Creek	Uses of water for natural or artificial recharge of groundwater for purposes of future extraction, maintenance of water quality, or halting saltwater intrusion into freshwater aquifers.
Municipal and Domestic Supply (MUN) - Upper and Lower Crystal Springs Reservoirs - San Andreas Reservoir - Calaveras and San Antonio Reservoirs	Uses of water for community, military, or individual water supply systems, including drinking water supply.
Preservation of Rare and Endangered Species (RARE) - Upper and Lower Crystal Springs Reservoirs - San Andreas Reservoir	Uses of waters that support habitats necessary for the survival and successful maintenance of plant or animal species established under state and/or federal law as rare, threatened, or endangered.
Noncontact Water Recreation (REC-2) - Alameda Creek - Upper and Lower Crystal Springs Reservoirs - San Andreas Reservoir	Uses involving proximity to water, not normally including water contact.
Fish Spawning (SPWN) - Alameda Creek - Upper and Lower Crystal Springs Reservoirs - San Andreas Reservoir	Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.
Warm Freshwater Habitat (WARM) - Alameda Creek - Upper and Lower Crystal Springs Reservoirs - San Andreas Reservoir	Uses of water that support warm water ecosystems, including preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife including invertebrates.
Wildlife Habitat (WILD) - Alameda Creek - Upper and Lower Crystal Springs Reservoirs - San Andreas Reservoir	Uses of water that support wildlife habitats, including preservation of vegetation and prey species used by wildlife such as waterfowl.

SOURCE: RWQCB, 1995

As listed in the Basin Plan, chlorine is regulated as a discharge limitation, whereas ammonia is regulated as a water quality objective for receiving waters. The discharge limitation for residual chlorine is 0.0 milligrams per liter (mg/L), which includes free chlorine plus chloramine, as the instantaneous limit. The water quality objective for ammonia is specified as un-ionized ammonia, the toxic form, and varies for different parts of the region due to differences in beneficial uses. The Basin Plan water quality objective for ammonia states that the "discharge of wastes shall not cause receiving waters to contain concentrations of un-ionized ammonia in excess of" a maximum level of 0.16 milligrams/liter as nitrogen (mg/L as N) in the Central Bay area or a maximum level of 0.40 mg/L as N in the Lower Bay area. The Central Bay is generally considered the area covering the northern part of San Francisco and most of Oakland and going north to Marin County and Richmond and is more sensitive due to the fish migratory corridor in the upstream reaches. The Lower Bay is considered the area covering most of San Mateo and Alameda Counties, including the greater Alameda Creek watershed. The project sites in the Sunol Valley, Pulgas, and Harry W. Tracy WTP areas would be considered in the Lower Bay, and the water quality objective of 0.40 mg/L as N would apply.

The chemistry of ammonia allows it to occur in either the un-ionized form (sometimes called free ammonia) or the ionized form (sometimes called ammonium ion). Total ammonia is the sum of both un-ionized and ionized ammonia. As indicated by the water quality objective, ammonia in the un-ionized form is toxic to aquatic organisms. The ionized form of ammonia is considerably less toxic. The relative concentration of the two forms of ammonia depends upon the pH and temperature of the water. The concentration of un-ionized ammonia, the toxic form, increases as the pH and temperature of the water increase. In the pH and temperature ranges of natural waters, the nontoxic, ionized form of ammonia predominates. In most instances, ammonia in discharge is diluted or degraded to a nontoxic form fairly rapidly (see discussion below under the heading "Degradation of Water Quality due to Operational Discharges," for further discussion of ammonia toxicity).

Stormwater Permit

The RWQCB administers the National Pollutant Discharge Elimination System (NPDES) stormwater permitting program in the Bay Area. Construction activities of five acres or more are subject to the permitting requirements of the NPDES General Permit for Discharges of Stormwater Runoff Associated with Construction Activity (General Construction Permit). Phase II requirements for permitting areas between one and five acres will not be fully implemented until early 2003. Discharges of stormwater associated with construction activity that result in the disturbance of five acres or more of total land area, or that are part of a larger common area of development or sale, must be permitted, which requires development of a Storm Water Pollution Prevention Plan (SWPPP). A SWPPP requires implementation of best management practices to minimize erosion and sedimentation, including requirements for grading and erosion control plans and other measures to protect surface waters from construction-related runoff.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for hydrology and water quality impacts, but it generally considers that implementation of the proposed project would have a significant effect on hydrology and water quality if it were to:

- substantially change absorption rates, drainage patterns, or the rate and amount of surface water runoff;
- substantially degrade water quality;
- contaminate a public water supply;
- substantially degrade or deplete groundwater resources or interfere with groundwater recharge; or
- cause substantial flooding, erosion, or siltation.

Criteria for evaluating surface water and groundwater quality in the San Francisco Bay Area are based on beneficial uses and water quality objectives established by the RWQCB, as authorized under the Porter-Cologne Water Quality Control Act and Clean Water Act. Both beneficial uses and water quality objectives are described in the Basin Plan. Criteria for evaluating flood hazards are based on effects to on-site and downstream 100-year flood zones, as established by the Federal Emergency Management Agency.

2.2 IMPACTS

Summary of Impacts by Project Component

Table IV.D-2 provides a summary of hydrology and water quality impacts associated with specific components of the proposed project and their respective level of significance.

Project-Level Impacts

Degradation of Water Quality During Project Construction

Construction of the proposed facilities could result in degradation of the water quality of surface waters at each project location through sedimentation, accidental spills, or dewatering activities. Construction activities would expose disturbed soil to surface runoff, which in turn could contaminate stormwater runoff and degrade local surface water quality. In particular, excavation, grading, and other earthmoving operations could result in sedimentation and erosion, and thus degrade surface water quality. The potential for erosion and sedimentation would vary for each site and depends on numerous factors, including extent of proposed construction activities, amount of cut and fill, amount of excavation, types of soil, and proximity to surface waters. In addition, accidental chemical or fuel spills from construction equipment and materials

TABLE IV.D-2
SUMMARY OF IMPACTS – HYDROLOGY AND WATER QUALITY

Impact	Tesla Portal Site	Sunol Valley Sites: San Antonio Pump Station Site	Sunol Valley Sites: Alameda East Portal Site	Sunol Valley Sites: Alameda West Portal Site	Pulgas Sites: Pulgas Site	Pulgas Sites: Pulgas Balancing Reservoir Site	Harry W. Tracy WTP Site	Secondary Discharge Locations
Project Level								
Construction impact to water quality	LS	LS	LS	LS	LS	LS	LS	LS
Operational discharge impact to water quality	N/A	N/A	LS	LS	LS	LS	PSM	PSM
System failure impact to water quality	N/A	LS	LS	LS	LS	N/A	LS	LS
Chemical spill impact to water quality	LS	LS	LS	LS	LS	N/A	LS	LS
Impact to facilities from flooding	N/A	LS	N/A	N/A	LS	N/A	N/A	N/A
Increase in stormwater runoff	LS	LS	LS	LS	LS	N/A	LS	LS
Program Level	**Systemwide**							
Secondary systems releases	PSM							
Operational discharge impact to water quality from BAWUA agencies' systems	PSM							
End use of chloraminated water	LS							

SM = Significant Impact, can be Mitigated
LS = Less than Significant Impact
PSM = Potentially Significant Impact, can be Mitigated
SU = Significant Unavoidable Impact
B = Beneficial
N/A = Not Applicable

could affect water quality. At one site, dewatering could be required during construction, and depending on the quality of the groundwater, disposal of dewatering effluent could degrade surface water.

Excavation, grading, and other earthmoving operations would be required at all sites. Without preventive measures, these activities can readily erode and transport excessive sediments to surface waters and degrade water quality. The estimated size of construction areas at the project sites are as follows: Tesla Portal site – 2.2 acres; San Antonio Pump Station site – 0.9 acres;

Alameda East or West Portal site – 0.1 acres; Pulgas site – 9 to 10 acres; and Harry W. Tracy WTP – 0.07 acres (see Section III.G, Table III-2).

The Pulgas site is greater than five acres and therefore would be subject to provisions of the RWQCB General Permit for Discharges of Stormwater Runoff Associated with Construction Activity. At the Pulgas site, extensive excavation and associated stockpiling would be required for the contactor pipeline/basin as well as grading for the building and access driveway. To prevent impacts to Upper Crystal Springs Reservoir and tributary drainages in the project area, the contractors would be required to prepare and implement a SWPPP to comply with the RWQCB stormwater permit. This plan would provide detailed, site-specific requirements for erosion control. Compliance with the RWQCB General Permit and implementation of the SWPPP would prevent degradation of water quality in the project area. Thus, water quality impacts associated with stormwater runoff during construction at the Pulgas site would be less than significant.

All other project sites (Tesla Portal, San Antonio Pump Station, Alameda East and West Portals, and Harry W. Tracy WTP) would be less than five acres. However, the potential for erosion and sedimentation would exist at all sites. At Tesla Portal, extensive cut and fill is proposed to support the access roadway, though there are no nearby surface waters. At the San Antonio Pump Station and Alameda East and West Portal sites, the construction areas are all under one acre but are in proximity to Alameda Creek. At Harry W. Tracy WTP, one of the alternate sites is on a hillside that would require extensive grading. Although these sites are not subject to the RWQCB permit, the contractors at these sites would be required to comply with standard SFPUC construction specifications for erosion and sediment control. These specifications include installation of appropriate sediment barriers (such as silt fences or straw bales) downstream of construction areas prior to earthwork, repair and maintenance of these barriers during construction, and removal and disposal of the barriers upon completion of construction. The SFPUC construction specifications also state, "No debris, soil, ash, silt, sand, cement or concrete or washing thereof, oil or petroleum products or other organic materials…shall be allowed to enter or be placed where it may be washed by rainfall or runoff into the waters of the United States." Implementation of these construction specifications would prevent degradation of water quality at all sites. Thus, water quality impacts associated with stormwater runoff at all project sites would be less than significant.

At all project sites, construction equipment and vehicles would require the use of chemicals, petroleum fuels, and other substances that are deleterious to water quality. Use of these substances in proximity to surface waters would increase the potential for a spill or release into surface waters. However, as described above, SFPUC standard construction specifications include provisions for handling and storage of hazardous materials on construction sites that require compliance with all applicable environmental and hazardous materials regulations. The specifications generally require fuel to be stored within a lined, bermed area that has capacity to contain 150 percent of the maximum fuel volume. Other environmental regulations require a Spill Prevention Control and Countermeasure Plan to address any hazardous materials used or stored on site as part of construction activities. Implementation of the construction

specifications to comply with all applicable environmental and hazardous materials regulations would prevent degradation of water quality in the project areas at all sites. Thus, impacts would be less than significant.

Excavation depths at the Pulgas site would be at least 15 feet for the contactor pipeline or basin, and groundwater could be encountered. To install facilities, dewatering could be required. Depending on the quality of the groundwater and the method of disposal, dewatering effluent could degrade surface waters. If dewatering were necessary, the contractors would be required to either contain the discharge in tanks and haul it off site for disposal, or to obtain a permit from the RWQCB for disposal to local waterways. Discharge to local waterways must comply with RWQCB Basin Plan requirements for surface waters. Implementation of regulatory requirements would prevent degradation of water quality from dewatering activities. Thus, impacts would be less than significant.

Degradation of Water Quality Due to Operational Discharges

The use of chloramine can be beneficial to the quality of a potable water supply, but the discharge of chlorinated and chloraminated water into natural waters can be detrimental due to the toxicity of chlorine, ammonia, and chloramine for aquatic organisms and to the potential biostimulatory effect of nitrogen loading. These potential effects on water quality as they relate to the project in general and to each project site are discussed below.

Chlorine Toxicity. Chlorine residuals (both free and combined) are acutely toxic to aquatic organisms at low concentrations and are persistent due to their stability. The USEPA has proposed stringent discharge requirements for total residual chlorine, stating that the four-day average concentration in freshwater systems shall not exceed 0.011 mg/L more than once every three years. The Basin Plan has an instantaneous effluent limitation of 0.0 mg/L for residual chlorine. Under the proposed project, dechlorination or dechloramination facilities are proposed at all possible discharge locations downstream of the chlorine injection points to remove all chlorine residual from discharges to surface waters and to assure compliance with the Basin Plan requirements. These discharges are discussed further following the toxicity and nitrogen loading discussions, below.

Ammonia Toxicity. In water, ammonia exists in un-ionized and ionized forms. Un-ionized ammonia is toxic, while the ionized form is relatively harmless. The relative concentration of the two forms of ammonia depends upon the pH and temperature of the water, where the concentration of un-ionized ammonia, the toxic form, increases as the pH and temperature of the water increase. In the pH and temperature ranges of natural waters, the nontoxic form of ammonia predominates. In most instances, ammonia in discharges is diluted or degraded to a nontoxic form fairly rapidly.

Under the proposed project, ammonia would be injected into the chlorinated SFPUC water supply to form chloramine as the residual disinfectant. However, due to the dynamic nature of water chemistry, ammonia can still be present in its uncombined forms. Depending on the

concentration of un-ionized ammonia, any release of chloraminated drinking water into surface water has the potential to result in ammonia toxicity concerns.

- To determine if the proposed project would result in ammonia toxicity in surface waters, a worst-case condition was analyzed to calculate the concentration of un-ionized ammonia that could be discharged to surface waters. The proposed project is designed such that the maximum concentration of total ammonia in the SFPUC water supply would be 0.50 mg/L (SFPUC, 1999). At Upper Crystal Springs Reservoir, the pH ranges from about 6.5 to 8.5, and the temperature ranges from about 10° C (degrees Celsius) to 24° C; under these conditions, the maximum concentration of the toxic form of ammonia in the chloraminated water would be approximately 0.07 mg/L, well below the Basin Plan objective of 0.40 mg/L that applies to the receiving waters in the project area. The pH of the discharge would be maintained at a level less than 8.0 as part of the dechloramination process, which would also maintain the ammonia in the discharge below toxic levels. Even with a pH level of 9.0 in the discharge water, the maximum level of un-ionized ammonia would be 0.14 mg/L as N (at 20°C) and would still be below the toxic level for receiving water. Under normal operating conditions, total ammonia levels would be reduced below 0.50 mg/L in the dechloramination process, and un-ionized ammonia levels would be even less than described above. Therefore, toxic ammonia conditions would not occur under normal operating conditions or even under system upset conditions.

  This scenario would be typical at other discharge locations along the SFPUC water supply system, where pH and temperature of surface water bodies would result in ammonia levels below the toxic threshold. Similarly, since the dechlorination or dechloramination process would lower the pH of the system water prior to discharge, the pH and temperature of the discharge would also result in ammonia levels below the toxic level for receiving waters. Therefore, the proposed project would not result in ammonia toxicity conditions in surface waters during normal operating conditions, during system failure, or due to any unanticipated release of chloraminated water.

- **Chloramine Toxicity.** Chloramine is regulated in the Basin Plan as a form of chlorine. Like chlorine and ammonia, chloramine is toxic to aquatic life due to its reactive nature. Chloramine has been shown to be toxic to both fish and invertebrates (aquatic animals that take water directly into their system, such as through gills), and it is generally more stable and more persistent than chlorine. Studies have shown that toxicity of chloramine, similar to that of chlorine, appears to be influenced by pH, with lower toxic effects with lower pH. If discharged into natural waters, chloramine may result in toxic conditions to aquatic organisms, depending on the concentration and ambient conditions (SFWT, 1996). Additionally, the use of chloramine can introduce both chlorine and ammonia into natural waters, either as free ions or through disassociation of the chloramine molecule after its introduction to natural waters. Depending on the frequency and volume of anticipated discharges, either dechlorination or dechloramination of discharges to natural waters is proposed as part of the project. In locations where discharges to natural waters occur, removal of all of the residual chlorine, as proposed through dechlorination or dechloramination, would eliminate toxicity associated with chloramine. Therefore, since the proposed project would remove all residual chlorine at all discharges to natural waters, the

● project would be in compliance with Basin Plan requirements and would provide protection of aquatic organisms from chloramine toxicity.

Nitrogen Loading. If chloramine is released into a natural water body, the ammonia may become free and oxidize to form nitrate, which is an available nutrient form for plant uptake. An increase in nutrient availability can produce higher aquatic plant growth, such as an increase in

algae. Algae, or phytoplankton, are free-floating, one-celled organisms that are ubiquitous in surface waters and can respond rapidly to changes in water quality. Many algae types are a primary food source for higher organisms. Some species of algae flourish in highly eutrophic waters and can develop noxious blooms that cause offensive tastes and odors. Excessive algal growth may deplete dissolved oxygen and cause toxic conditions, resulting in fish kills (Maidment, 1993). Although algal blooms usually pose no direct health effects to humans, certain species produce endo- or exotoxins that may be harmful to aquatic life (Pennsylvania State University, 2000). Algal by-products can produce offensive tastes and odors in drinking water and can be difficult to remove without advanced water treatment processes.

National standards have not been established for algae populations. The surface water objective provided in the Basin Plan indicates that waters should "not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses." Irregular and extreme levels of chlorophyll *a* or algal blooms would indicate when this objective has been exceeded. Algal blooms may be controlled by decreasing nutrient concentrations in the water body.

The input of a limited ammonia residual into a water body does not automatically cause an algal bloom. Algal blooms are typically associated with quiescent water bodies, such as lakes or ponds, and are not as prevalent in highly dynamic systems such as creeks or rivers. Algal growth is dependent upon factors other than the input of nitrogen. Phosphorus can be a limiting factor, and often more so than nitrogen, since phosphorus is typically less available in aquatic systems. A nitrogen to phosphorus ratio above 10:1 will likely cause an algal bloom, the severity of which will be related to excess phosphorus. Below that ratio, nitrogen is typically the limiting nutrient in the system, and a bloom may be related to excess nitrogen (Schindler, 1978). Freshwater systems tend to be phosphorus-limited (Pennsylvania State University, 2000).

Site-specific water quality impacts associated with operational discharges of chlorinated and chloraminated water at the various project sites are discussed below.

Tesla Portal. There are no planned operational discharges from the proposed Tesla Portal chlorination facility.

San Antonio Pump Station. Although the San Antonio Pump Station discharges to San Antonio Creek and San Antonio Reservoir as part of normal operations, these discharges will continue regardless of the proposed project and would occur upstream of and prior to the addition of ammonia and chlorine at the proposed new San Antonio Pump Station facility. There would be no planned or unplanned operational discharges from the proposed San Antonio Pump Station ammonia feed and chlorine trim facility.

Alameda East Portal. Overflow discharges of Hetch Hetchy water from the Alameda East Portal currently flow into the Alameda Creek floodplain near the San Antonio Pump Station. Alameda Creek is approximately 1/4 mile from Alameda East Portal. Overflows tend to occur on a weekly basis. The amount is uncertain, but the total release is typically less than 1 million gallons. Currently, these overflows are dechlorinated prior to discharge using a temporary

facility located next to the overflow shaft. These overflows would occur upstream of the addition of ammonia and chlorine at the San Antonio Pump Station, so there would be no change in the nature of these overflows. The proposed project would construct a permanent facility, and thus the reliability of the dechlorination facility would be increased. Due to dechlorination and the distance from the creek, no impact to water quality would occur from an operational release of water at the Alameda East Portal.

Alameda West Portal. Alameda Creek is approximately 1/4 mile from the Alameda West Portal and, similar to Alameda East Portal, overflows of Hetch Hetchy water can flow to Alameda Creek. However, due to operational changes in the SFPUC water system, overflow discharges have not occurred at the Alameda West Portal in recent years. If any overflow discharge were to occur after implementation of the proposed project, flows from Alameda West Portal would be chloraminated water that could potentially enter the Alameda Creek floodplain. Overflow from the Alameda West Portal would not likely reach Alameda Creek, due to the typically low volume and distance from the channel. The proposed project would include either a permanent or portable dechlorination facility at this location, depending on the frequency and volume of overflows. As described above, chlorine, ammonia, and chloramine toxicity conditions would not occur, because the dechlorination facility would remove all chlorine residual from the discharge, and the pH, temperature, and low levels of total ammonia would not result in ammonia toxicity. In addition, due to the low volume and frequency of overflows at Alameda West Portal and the ephemeral nature of Alameda Creek, biostimulatory effects to Alameda Creek would not likely occur from low levels of ammoniated discharges. Because occurrences appear to be minimal, the portal is 1/4 mile from the creek, and a dechlorination facility is proposed as part of the project, the proposed project would not substantially degrade water quality in Alameda Creek. Thus, water quality effects from any operational release of chloraminated water at the Alameda West Portal would be less than significant.

Pulgas Site. The discharge of large volumes of dechloraminated water into Crystal Springs Reservoir as part of the normal operation of the Pulgas Dechloramination Facility could potentially reduce water quality due to the presence of residual ammonia, which is regulated under the Basin Plan. Under the proposed project, the chlorine residual (in the form of free chlorine or chloramine) in the discharge would be reduced to the regulatory level of 0.0 mg/L at the proposed dechloramination facility, so chlorine and chloramine would pose no threat to water quality. As described above, ammonia toxicity would not occur due to the prevailing pH and temperature of receiving waters and the low levels of ammonia in the discharge, especially following the dechloramination process. The only water quality concern is due to the potential for residual ammonia to result in biostimulatory effects and lead to eutrophic conditions.

The SFPUC is currently conducting water quality, algal growth, and sediment tests in Crystal Springs Reservoir to determine site-specific sensitivity to nitrogen loading and to establish treatment levels that would minimize the potential impact of residual ammonia in the water discharged to Crystal Springs Reservoir (SFWT, 2000). These ongoing studies have indicated that the addition of nitrogen to the reservoir could induce algal growth and may cause the water to taste and smell planktonic. In addition, the low dissolved oxygen levels in Lower Crystal

Springs Reservoir were confirmed and shown to induce a release of phosphorus from reservoir sediments that could further increase algal growth with additional nitrogen input (SFWT, 2000). The proposed dechloramination facility would be designed so that treatment levels for ammonia removal could be adjusted according to fluctuating water quality and seasonal conditions. This flexibility in the proposed dechloramination process would help the facility to sustain proper dechloramination levels, even under changing conditions. Since the discharge level of the residual ammonia following dechloramination has yet to be determined, this EIR is based on the conservative assumption that facilities would be constructed for maximum levels of ammonia removal, or about 90 percent removal. A monitoring system composed of chlorine and ammonia analyzers proposed as part of the dechloramination design would regulate the level of ammonia residual. By monitoring the level of residual ammonia in the discharge stream to Crystal Springs Reservoir, the SFPUC could control the level of ammonia released to the reservoir and thereby protect water quality from biostimulatory effects. This would reduce the potential impact to less than significant.

Pulgas Balancing Reservoir. Currently, overflows of treated water occur at the Pulgas Balancing Reservoir about once a year. These discharges flow down an unnamed drainage south of the Pulgas Water Temple public parking lot and eventually flow to Upper Crystal Springs Reservoir. These releases from the Balancing Reservoir are planned to be dechlorinated at the overflow location as part of the Pulgas Dechlorination Facility (see Section VI.B.1.0, Related Projects and Plans). However, if the proposed project were implemented, these overflows would also contain ammonia from the chloramination process at the proposed San Antonio Pump Station ammonia feed and chlorine trim facility. Depending on the volume of these overflows, minor amounts of ammonia could flow to Upper Crystal Springs Reservoir and result in biostimulatory effects. However, the Balancing Reservoir is over 1/4 mile from Upper Crystal Springs Reservoir, and any residual ammonia in these infrequent overflows would likely be taken up by plants along the unnamed drainage corridor prior to reaching the reservoir. Thus, no water quality effects to Upper Crystal Springs Reservoir associated with overflows of chloraminated water from the Pulgas Balancing Reservoir would be expected, and this impact would be less than significant.

Harry W. Tracy Water Treatment Plant. The Harry W. Tracy WTP experiences periodic overflows of raw water (prior to treatment), ozonated water (following ozone treatment), and treated water (post-chlorination). These overflows are collected and discharged to San Andreas Reservoir. Additionally, following a filter backwash, wash water is released to San Andreas Reservoir. After completion of the Harry W. Tracy WTP Residuals Project (see Section VI.B.1.0, Related Projects and Plans), this wash water will be settled, the clarified water released to San Andreas Reservoir, and the collected solids hauled by truck to the City's Oceanside Water Pollution Control Plant.

If the proposed chlorine and ammonia feed facilities are constructed, chloraminated water could overflow through the treated water reservoirs to San Andreas Reservoir. As part of this project, a permanent dechlorination facility would be built at Harry W. Tracy WTP to remove chlorine from these overflows prior to discharge to San Andreas Reservoir, and thus no chlorine would be

discharged to the reservoir. However, the overflows would still have limited ammonia residual that could affect water quality in the reservoir. A recent study of the reservoir indicates that, similar to Crystal Springs Reservoir, the addition of nitrogen to the reservoir could induce algal growth (SFWT, 2000). However, it is anticipated that the overflows would be in small, rarely occurring volumes that would not be sufficient to cause algal stimulation. The potential for algal stimulation is also reduced by the reservoir's annual turnover rate; San Andreas Reservoir typically sees a six-fold turnover each year as part of normal operations. However, to assure that overflows of ammoniated water from Harry W. Tracy WTP to San Andreas Reservoir do not promote algal stimulation, mitigation measures are recommended for nutrient management, overflow, and reservoir quality monitoring, as described in Sections V.C and V.D. Implementation of these measures would reduce impacts to water quality to less than significant.

Water Quality Degradation from System Failure

While the conversion to chloramine would improve potable water quality, a system failure could release chloraminated water into nearby water bodies. Such a release could degrade water quality due to the presence of chlorine, ammonia, and chloramine and their potential toxic effects on aquatic organisms, and due to the biostimulatory effects of nitrogen loading, as discussed above under the heading "Degradation of Water Quality due to Operational Discharges."

Upper Crystal Springs Reservoir is the major water body of concern with respect to potential release of chloraminated water due to a system failure. If a system failure occurred at the Pulgas Dechloramination Facility, super-chlorinated water (10 mg/L) and possibly chloraminated water could be discharged to Upper Crystal Springs Reservoir. As part of the dechloramination process (see also Section III.D.2.0, Removal of Chlorine and Ammonia), high doses of chlorine are injected into the chloraminated water to oxidize the ammonia portion of the chloramine, which converts the ammonia to harmless nitrogen gas. Under normal operations, the high level of chlorine residual is then removed by adding dechlorinating chemicals, but if a system failure were to occur at this point in the process, water with a very high chlorine residual (super-chlorinated water) could be released to Upper Crystal Springs Reservoir and could result in highly toxic conditions for fish and other aquatic life. Without adequate safeguards, backups, and precautionary measures, this would be a potentially significant water quality impact. As described below, provisions for redundancy would be included in the facility design and operations, minimizing the probability of such failures.

San Andreas Reservoir receives inflow indirectly from Upper Crystal Springs Reservoir via Lower Crystal Springs Reservoir and from overflows at the Harry W. Tracy WTP. Alameda Creek could receive inflow from Alameda East and Alameda West Portals. Following a system failure such as a pipeline rupture at any of these locations, chlorine, ammonia, and chloramine could be discharged to these water bodies in unknown amounts and would be potentially significant without appropriate precautions. However, at these locations, a system failure would not result in super-chlorinated water discharges. As described previously, there are no water bodies of concern in the vicinity of the Tesla Portal, and the Pulgas Balancing Reservoir internal piping improvements would not be subject to a chemical system failure.

The proposed project would be designed with emergency provisions, including an uninterruptible power supply and facility components that comply with state and federal construction standards. Facilities would be constructed to meet current building and seismic safety standards to withstand maximum probable earthquakes. There would be redundant design elements included in the project to minimize a dechloramination facility failure. Site-specific emergency response plans and operations plans for system problems or failures are also proposed as part of the project.

Due to the remote likelihood of a system failure and to the safeguards proposed as part of the project, the potential impact to water quality due to system failure is considered less than significant at all sites.

Water Quality Degradation from a Chemical Spill

A chemical spill from the chlorine system at the Tesla Portal facility, the chloramine system at the San Antonio Pump Station, the dechlorination facilities at the Alameda East and West Portals, the dechloramination system at the Pulgas site, or the chlorine, ammonia, and dechlorination systems at Harry W. Tracy WTP would have the potential to discharge toxic pollutants into local water resources and degrade water quality. However, the project facilities would meet regulatory standards for secondary containment, thus reducing the potential for chemical spills. Metering pumps and flow meters would regulate all chemical and water flows, with alarms and indicators to warn of any potential problems. Containment areas would have berms, valves, sump pumps, and level indicators for monitoring in-tank chemical levels and containment area water or chemical spills. A site-specific hazardous materials business plan would describe the hazardous material and management practices and address potential chemical spill scenarios for each facility. An emergency response plan for each facility would specify response measures in case of chemical spills. Therefore, this impact is considered less than significant for all project sites. Section IV.I, Hazardous Materials, provides further discussion of this topic. The Pulgas Balancing Reservoir internal piping improvements would not be subject to chemical spills, and this impact is not applicable at this site.

Potential Disruption of Project Facilities due to Flooding

Tesla Portal. The Tesla Portal site is not within a designated floodplain, nor has the existing facility experienced any flood problems. Flooding impacts are not applicable at this site.

San Antonio Pump Station. Flooding of the San Antonio Pump Station site could potentially interfere with future facility operations. The San Antonio Pump Station site is not located within the 500-year floodplain boundary of Alameda Creek. The site is known to become saturated during the winter and spring seasons, likely due to local surface runoff (refer to Section IV.C, Biological Resources, for a discussion of wetlands). Under the proposed project, the area would be filled to raise the station pad to improve site drainage. Collection of minor surface runoff in or around the proposed facility would not present a significant impact to facility operations, due to the limited area of impervious surfaces proposed for the facility (1/2 acre). Therefore,

interruption of facility operations by flooding or drainage is considered a less than significant impact.

Failure of Calaveras Dam could partially inundate the San Antonio Pump Station site and interrupt operations at the proposed ammonia feed and chlorine trim facility. As part of the proposed project design, the chemical feed facility site would be raised through the use of fill in order to counter saturated conditions during the storm season. Because the site is on the periphery of the predicted inundation pattern (and would be subject to very limited flood waters), raising the site would remove it from the area of potential effect due to dam failure. The facility pump station would be built with an interruptible power supply and would be able to withstand minor flooding under current design. The facility would be built with containment areas and facilities to effectively control potential system interruptions. Therefore, interruption of facility operations by flooding due to a dam failure is considered a less than significant impact.

Alameda East and West Portals. The Alameda East and West Portal sites are outside of the Alameda Creek 500-year floodplain and are located on hillside slopes with sufficient drainage. These sites are therefore not subject to flooding impacts, and analysis of this impact is not applicable.

Pulgas Site. The Pulgas site is outside of designated floodplains and is located on a gentle slope with adequate drainage. One of the reasons this site was selected is that the proposed Lower Crystal Springs Dam Abutment Project (see Section VI.B.1.0, Related Projects and Plans) would not likely have an effect on this site. The floor elevation of the proposed facility site would be 315.5 feet above mean sea level. The Pulgas Water Temple and surrounding visitor facilities are lower than the dechloramination facility. The current dam spillway is at 284 feet above mean sea level. The dam abutment would not be operated at a water level that would inundate the Pulgas Dechloramination Facility site or Cañada Road. Therefore, the potential impact to operations from flooding and drainage at the Pulgas site is considered less than significant.

Pulgas Balancing Reservoir. The Pulgas Balancing Reservoir site is outside of designated floodplains and has not experienced any flooding problems with the current facilities. Therefore, this site is not subject to flooding impacts.

Harry W. Tracy Water Treatment Plant. The Harry W. Tracy WTP is outside of designated floodplains and has not experienced any flooding problems with the current facilities. Therefore, this site is not subject to flooding impacts.

Increase in Stormwater Runoff

With the exception of the Pulgas Balancing Reservoir site, construction of proposed facilities at all sites would result in a slight increase in impervious surfaces through the construction of structures and paved areas. Increases in the area of impervious surfaces would result in an associated incremental increase in stormwater runoff volume, as well as the potential for water quality contaminants associated with stormwater runoff to enter surface water bodies.
Table III-1 in Chapter III, Project Description, presents the estimated increase in area of

impervious surfaces at each site, ranging from 600 to about 40,000 square feet. Considering that all sites would have less than one acre of new impervious surfaces, any associated increase in the volume of stormwater runoff would be negligible. Similarly, there would be negligible increases in contaminants associated with the stormwater runoff. Project sites would be landscaped to minimize the potential for stormwater runoff that could result in erosion and subsequent sedimentation. In addition, as described above under "Water Quality Degradation from a Chemical Spill," the proposed project would include secondary containment, drainage, and spill response provisions to minimize the potential for water quality contaminants to enter surface waters. Therefore, potential impacts associated with increases in stormwater runoff at all sites would be less than significant.

Program-Level Impacts

Degradation of Water Quality Due to Secondary System Releases

On a program level, release of chlorinated or chloraminated water into natural water bodies from overflows or blowoff valves at secondary discharge locations would not pose a threat to water quality, for the reasons discussed below. Blowoff or overflow releases from parts of the overall transmission and distribution system are possible and do occur as controlled and uncontrolled releases. Controlled releases, sometimes referred to as water transfers, are not a water quality concern, since these releases are directed into portable treatment systems or sewer systems as part of the planned release. Uncontrolled releases of known overflows pose a minor threat to water quality but are sporadic in nature and generally limited in volume. The project calls for permanent dechlorination facilities at uncontrolled release sites where volumes typically would exceed 1 gallon per minute (gpm). Many of these uncontrolled releases occur within the City Distribution Division (CDD) and do not present a threat to surface water quality, since these releases enter the San Francisco sewer system as part of the current system design, and chlorine residual would be removed as part of the wastewater treatment process; therefore, a separate dechlorination system is not required for these discharges.

Table IV.D-3 outlines all known sites of substantial (greater than 1 gpm) uncontrolled releases at known overflow points for the SFPUC system downstream of Tesla Portal. Each of these sites would have a dechlorination system capable of dechlorinating at volumes recorded for past releases, such that no chlorine residual would be discharged to surface water. These systems could be permanent or portable, depending on potential release volumes. Permanent dechlorination facilities proposed for the Alameda East and West Portals and the Harry W. Tracy WTP are described above under project-level impacts and are not shown in this table. A temporary dechlorination system would entail a smaller dechlorination system, such as a portable trailer, day tanks, or tablets that would be effective during uncontrolled releases for smaller volumes of discharge.

Table IV.D-3 also lists one site where there are controlled discharges of drinking water to a surface water body. As part of normal operations and when water is available, the SFPUC occasionally discharges treated drinking water to Lake Merced to raise the water level. Temporary dechlorination facilities are used to treat the chlorinated water prior to its discharge

TABLE IV.D-3
SECONDARY DISCHARGE LOCATIONS AND PROPOSED DECHLORINATION STRATEGY

Site	Eventual Discharge Path	Type of Discharge under Proposed Project	Overflow (mgd)	Estimated Frequency	Proposed Dechlorination Strategy
Uncontrolled Discharge Sites					
Pulgas Tunnel Shafts	Flows to Cordilleras Creek	Chloraminated	NA	NA	Permanent or Portable Facility
Pulgas Pump Station	Flows to Upper Crystal Springs Reservoir	Chloraminated	NA	NA	Pulgas Dechloramination Facility
Potrero Heights Tank and Reservoir	Flows to combined sewer system	Chloraminated	NA	Once every 2 to 5 years	Existing Wastewater Treatment Plant
University Mound Reservoirs	Flows to combined sewer system	Chloraminated	NA	NA	Existing Wastewater Treatment Plant
Yerba Buena Island Tanks	Flows into catch basins with a final destination of the Bay	Chloraminated	NA	NA	Permanent or Portable Facility
Controlled Discharge Sites (Water Transfers)					
Lake Merced Pump Station	Pumped to Lake Merced	Chloraminated	NA	Less than once per year	Upgrade existing dechlorination facility or use portable facility; discontinue water transfers until water quality studies for nitrogen loading in Lake Merced are completed

NA= not available
mgd = million gallons per day

SOURCES: San Francisco Water Team, 1999; SFPUC, 1998

into the lake. If the proposed project were implemented, chloraminated water could be discharged to the lake, which could affect water quality of the lake. Dechlorination would still be used to remove the chlorine residual, but that process would not remove the ammonia residual present in chloraminated water. If ammoniated water were discharged into the lake, there would be the potential for increased levels of nitrogen from the ammonia to stimulate algae growth in the lake and to contribute to eutrophic conditions. However, it is unknown at this time if Lake Merced is nitrogen-limited, and if increased nitrogen availability would stimulate algae growth. As a mitigation measure included as part of the proposed project (see Section V.D of the mitigation measures chapter), the SFPUC would perform water quality studies to examine the potential impact of ammonia from chloraminated water to Lake Merced water quality. From these studies, the SFPUC proposes to develop allowable discharges to the lake given the anticipated ammonia residual following dechlorination. These studies would commence during the design phase of the proposed project and could be completed prior to project implementation. As an added precaution, if necessary, the SFPUC could suspend planned discharges of drinking water to Lake Merced following chloramine conversion until the water quality studies were completed. Due to the performance of water quality studies to determine appropriate discharge requirements prior to discharge of chloraminated drinking water to Lake Merced and the temporary suspension of discharges of drinking water, if necessary, impacts to Lake Merced would be less than significant.

The proposed design and construction schedule of the project indicates that conversion to chloramine would occur in 2003 at the earliest (see Section III.H, Project Schedule, Implementation, and Cost). It is anticipated that, by that time, the Lake Merced water quality studies would be complete and it would be known whether or not the ammonia in chloraminated water would result in adverse water quality effects. The studies could result in two possible outcomes: (1) either discharge of chloraminated water to Lake Merced would be acceptable with dechlorination only; or (2) residual ammonia in discharges of chloraminated water to Lake Merced following dechlorination could result in algal stimulation effects. If the first outcome is validated, then water transfers to Lake Merced could continue as is currently practiced with no adverse effects. If the second outcome is validated, the SFPUC would need to remove or reduce the levels of ammonia in the water prior to discharge (by constructing a dechloramination facility), eliminate discharges of chloraminated water, or use alternate water supplies for water transfers to Lake Merced. Under either scenario, the SFPUC would assure that the water quality of Lake Merced is protected from possible adverse impacts from chloraminated water.

On a program level, the proposed dechlorination strategies and mitigation measures included in project design would reduce impacts from both intentional and incidental secondary discharges to a less than significant level. Construction impacts associated with any proposed permanent facility would be similar to those described above for the proposed project locations, and compliance with RWQCB stormwater requirements and applicable environmental and hazardous materials regulations would reduce potential construction impacts to less than significant. Similarly, potential impacts associated with system failure at secondary discharge locations and with chemical spills would be the same as for the proposed project sites, and safeguards proposed as part of the project would render these impacts less than significant.

Degradation of Water Quality Due to Discharges from BAWUA Member Agency Systems

Specific construction-related impacts of potential changes to the Bay Area Water Users Association (BAWUA) systems is outside the scope of this EIR and would be addressed by BAWUA member agencies, as necessary, during environmental review of potential changes to their individual systems, as warranted. In general, changes to BAWUA members' distribution systems to accommodate the chloramine conversion would likely be limited compared to changes proposed to the Hetch Hetchy system, since the primary and residual disinfection would already be completed prior to water distribution to BAWUA agencies. However, some agencies could need to provide blending facilities to accommodate chemical changes associated with mixing chloraminated water from the SFPUC system with either chlorinated water, other chloraminated water, or unchlorinated water supplies.

Additionally, some BAWUA members could face a potential water quality alteration with respect to groundwater blending. The chloramination of groundwater does not typically present a potential water quality impact, but the system operator must be aware of the interaction of the chloramine ion and groundwater constituents. High ion levels in groundwater could react with the chloramine ion and cause secondary effects to taste and odor (SFPUC, 1999).

Based on the assumption that changes to the BAWUA member agencies' systems would be comparable or smaller than those at the SFPUC project components, threats to water quality would likely be similar or less. Impacts to water quality from BAWUA system releases would parallel those identified for the Hetch Hetchy and CDD systems. The potential exists for release of chloraminated water into water bodies due to system releases or pipeline breaks that could affect water quality of local water resources. As with the SFPUC, BAWUA members have operational controls to limit volumes when system releases are necessary or pipelines rupture, as well as to limit automatic overflows or other secondary discharges. Additionally, the remaining chloramine residual would dissipate if released over land or be diluted if discharged to a waterway. The BAWUA member agencies would be required to comply with RWQCB standards for removal of chlorine prior to discharge to surface water. As with the SFPUC system, ammonia would likely be present at less than toxic levels, but algal stimulation due to increased nitrogen loading would be site specific, depending on individual water bodies and water chemistry.

BAWUA members could also experience changes to in-system water quality with respect to nitrification and blending of other water sources. Nitrification[1] is possible where water has been stored for long periods of time in the same location. Other water suppliers have noted increases in nitrification and decreases in chloramine residuals in such cases (SFPUC, 1999). Nitrification can increase nitrate levels, decrease chloramine residual levels, and allow for greater bacterial growth in the distribution system. The SFPUC is aware of this problem and will develop

[1] Nitrification is the oxidation of ammonia and nitrite to nitrate, which is a relatively stable ion under aerobic conditions. It is caused by the proliferation of nitrifying bacteria, and contributing factors leading to nitrification generally include long detention times, elevated temperature, excess ammonia, and low chloramine residual. The result of nitrification is a depletion of disinfectant residual that may lead to increased growth of bacteria and pathogenic organisms.

nitrification control and response guidelines as part of the project to reduce the potential for nitrification. BAWUA members would need to conduct a comprehensive evaluation of their individual systems and take appropriate engineering measures to correct areas susceptible to nitrification. Public health issues related to water quality are discussed in Section IV.E, Public Health and Water Supply.

In order to reduce potentially significant water quality impacts to local water bodies, BAWUA member agencies should conduct a comprehensive evaluation of their individual systems to determine specific water quality control measures that would prevent discharge of harmful substances to local water bodies. At a minimum, the BAWUA agencies should include the following measures, which are similar to those included in the proposed project: dechlorination facilities for overflows and secondary discharges of chloraminated water; secondary containment for all chemical loading and storage facilities; adequate separation of incompatible chemicals; water quality studies to determine algal stimulation potential for sensitive water bodies subject to discharge of chloraminated water; emergency response procedures in the event of system failures; and construction provisions for erosion and sedimentation control and for release of chemicals or fuels to water bodies (see Section V.D of the mitigation measures chapter).

On a program level, implementation of the recommended mitigation measures would reduce potential water quality impacts to less than significant.

Degradation of Water Quality Due to End Use of Chloraminated Water

Household discharges of chloraminated water, such as watering lawns and landscaping, car washing, or hosing off patios or walkways, would not result in harm to creeks or the Bay. These types of household discharges are not large enough to threaten waterways. Also, the chloramine in such discharges dissipates through contact with lawns and soil (EBMUD, 1998). Chloraminated water discharged to the sanitary sewer would not pose a threat to water quality, following post-treatment discharge of wastewater. The chloramine residual is a disinfectant that would be absorbed during wastewater treatment. For industrial discharges that also require treatment prior to discharge, the chloramine residual would be absorbed during the use and treatment process, thus resulting in no post-treatment discharge impact to natural waterways. Therefore, end use of chloraminated water would pose less than significant water quality impacts.

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E. PUBLIC HEALTH AND WATER SUPPLY

The Initial Study for this project identified several public health issues to be discussed in the EIR (see Appendix A). These issues relate to the effectiveness of chloramination for disinfection, existing drinking water quality, proposed changes in drinking water standards, potential changes in water quality, and effects on sensitive users. Consistent with the Initial Study findings, this section provides further discussion of these issues.

1.0 SETTING

Disinfection of drinking water, particularly chlorination, has effectively eliminated waterborne diseases that were widespread before the 1900s, such as cholera, typhoid fever, and dysentery. Regulations requiring the disinfection of drinking water have vastly improved the drinking water quality and controlled the spread of bacteria that cause these waterborne diseases. However, in 1974 it was recognized that chlorination—the process of using chlorine to disinfect drinking water—results in reactions with organic and inorganic substances naturally present in the water, producing a variety of chemicals known as disinfection by-products. These include trihalomethanes, haloacetic acids, haloacetonitrites, and halopicrins. Chlorate and chlorite are by-products of disinfection using sodium hypochlorite or chlorine dioxide, and bromate is a by-product associated with ozonation of water containing bromide. Some of these disinfectant by-products are known or suspected to cause adverse health effects.

1.1 CURRENT DISINFECTION BY-PRODUCT LEVELS IN DRINKING WATER AND HEALTH EFFECTS

The SFPUC prepares an annual water quality report to inform City customers about the overall quality of their drinking water. The annual report provides data on all water quality parameters monitored by the SFPUC in accordance with federal and state regulations, including the range of concentrations detected and the average concentration detected for the year. The water quality data for disinfection by-products measured in 1999 are presented in Table IV.E-1.

Table IV.E-1 also includes the maximum contaminant levels (MCL)[1] and maximum contaminant level goals (MCLG)[2] specified for disinfection by-products in Stage 1 of the Disinfectants and Disinfection By-Products Rule (Stage 1 D/DBP Rule or Stage 1 Rule). MCLs are specified for total trihalomethanes and haloacetic acids. MCLGs are specified for the individual trihalomethanes (including chloroform, bromodichloromethane, dibromochloromethane, and bromoform), dichloroacetic acid, and trichloroacetic acid. Further research needs to be conducted to identify appropriate MCLs for the remaining disinfection by-products. The Stage 2 D/DBP Rule (or Stage 2 Rule), proposed for January 2002, would establish more stringent MCLs than the Stage 1 Rule.

1 The MCL is the highest level of a contaminant that is allowed in drinking water. The MCL is set as close to the MCLG as is economically or technically feasible. While the MCL is higher than the MCLG, it is considered protective of human health.
2 The MCLG is the level below which there is no known or expected health risk to human health.

TABLE IV.E-1
SFPUC WATER QUALITY DATA FOR DISINFECTION BY-PRODUCTS

Parameter	1999 SFPUC Water Quality Data (in μg/L)[a]		Federal Drinking Water Standards (in μg/L)[a]	
	Range	Average	MCL[b]	MCLG[c]
Total Trihalomethanes	30 to 107	75	80	-[d]
Chloroform	4.8 to 50	33	-	0
Bromodichloromethane	<0.5 to 6.7	3.2	-	0
Dibromochloromethane	<0.5 to 9.8	5.5	-	60
Bromoform	<0.5 to 0.7	0.6	-	0
Haloacetic Acids (HAA5)[e]	12 to 16	14	60	-
Dichloroacetic Acid	3 to 15	6	-	0
Trichloroacetic Acid	<1 to 13	9	-	300
Bromochloroacetonitrile	<0.5 to 0.8	<0.5	-	-
Dibromoacetonitrile	<0.5 to 1.1	<0.5	-	-
Dichloroacetonitrile	<0.5 to 2	1	-	-
1,1-Dichloropropanone	<0.5 to 1.3	<0.5	-	-
1,1,1-Trichloropropanone	<0.5 to 1.1	<0.5	-	-
Chloryl Hydrate	<0.5 to 13	8.3	-	-
Total Organic Halides	<50 to 211	173	-	-

a μg/L = micrograms per liter; equivalent to parts per billion.
b Maximum Contaminant Level: The highest level of a contaminant that is allowed in drinking water by USEPA; promulgated in 40 CFR, Part 141. MCLs are set as close to the MCLG as is economically or technically feasible. This level becomes effective December 16, 2001.
c Maximum Contaminant Level Goal: The level of contaminant in drinking water below which there is no known or expected risk to human health; promulgated in 40 CFR, Part 141. This level becomes effective December 16, 2001.
d - = Standard is not established for this chemical.
e Haloacetic acids (five) is the sum of the concentrations of dibromoacetic acid, dichloroacetic acid, monobromoacetic acid, monochloroacetic acid, and trichloroacetic acid.

SOURCES: SFPUC, 2000

Although the average concentration of total trihalomethanes in the SFPUC drinking water system is below the MCL, the highest concentrations measured in 1999 exceed the MCL set forth in the Stage 1 Rule. In addition, due to the long transmission and detention times in the SFPUC drinking water system as well as the differences in source water, variations in the concentrations of total trihalomethanes and haloacetic acids occur within the system. A treatment study conducted on behalf of the SFPUC indicates that, given the detention time, the tentative MCLs specified in the Stage 2 Rule would be exceeded if chlorine were used as the residual disinfectant (Camp Dresser & McKee, 1995). Conversion to chloramination through implementation of the proposed project would lower the concentration of total trihalomethanes in the SFPUC drinking water system and would allow the SFPUC to reliably comply with the Stage 1 and Stage 2 Rules.

Potential health risks associated with disinfection by-products are summarized in Table IV.E-2. Potential health effects associated with high levels of trihalomethanes include bladder, rectal, and colon cancer (SFPUC, undated). High levels of dichlorobromomethane (greater than 75 μg/L) have been associated with an increased risk of miscarriage, particularly when ingested during the first trimester of pregnancy (SFPUC, 1998). Dichloroacetic acid is associated with adverse health effects on the brain, testes, and eyes (SFPUC, undated).

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for public health and water quality impacts, but it generally considers that implementation of the proposed project would have a significant effect on public health and water quality if it were to contaminate a public water supply or create a potential public health hazard. Criteria for evaluating impacts to drinking water quality are based on California Drinking Water Standards, as established by the California Safe Drinking Water Act, and the National Primary Drinking Water Regulations, as established by the federal Safe Drinking Water Act (as amended).

2.2 IMPACTS

Summary of Impacts By Project Component

Table IV.E-3 provides a summary of the public health and water supply impacts associated with applicable components of the proposed project.

Increased Reliability in Meeting Drinking Water Standards

Conversion to chloramination would improve overall public health protection by consistently reducing disinfectant by-product concentrations in the SFPUC drinking water supply to levels below the adopted Stage 1 Rule MCLs and the tentative Stage 2 Rule MCLs. Chloramine is more stable than chlorine and would last longer in the distribution system. Coupled with free chlorine used for primary disinfection, chloramine used as a residual disinfectant would also provide comparable or increased protection from bacterial contamination in the distribution system compared to the current disinfection method, and the SFPUC water system would maintain continued compliance with the Total Coliform Rule. In addition, chloramination can readily be adapted to meet future demands for compliance with anticipated drinking water regulations.

While chloramination can produce the same disinfection by-products as chlorine, the levels of these by-products are reduced by as much as 80 percent compared with levels produced with chlorination. Therefore, the use of chloramine could substantially reduce the potential cancer risk in a given water supply, depending on the free chlorine contact time prior to the addition of ammonia. While chloramination, chlorination, and ozonation provide comparable levels of public health protection, the relative mean carcinogenic risk for the three methods of disinfection is 1.1, 5.6, and 6.3 extra cases per 100,000 population per lifetime (AWWA, 1993).

TABLE IV.E-2
HEALTH EFFECTS OF DISINFECTION BY-PRODUCTS

Class of Disinfection By-Product	Major Compounds Included	Known Potential Health Risks	Safe Level for Drinking Water[a]	Comments
Trihalomethanes	Chloroform Dichlorobromomethane Chlorodibromomethane Bromoform	Slightly higher incidence of bladder and colon cancer. Dichlorobromomethane is also associated with an increased risk of miscarriage.	Chloroform: 1 µg/L[b,c] Chlorodibromomethane: 20 µg/L[d] Bromoform: 81 µg/L[d] Dichlorobromomethane: 18 µg/L[e]	With the exception of chloroform, the concentrations of these compounds identified in SFPUC drinking water during 1999 were below these levels.
Haloacetic Acids	Chloroacetic Acid Dichloroacetic Acid Trichloroacetic Acid Bromoacetic Acid Dibromoacetic Acid	Dichloroacetic Acid: adverse health effects on the brain, testes, and eyes. Less is known about the other haloacetic acids.	Dichloroacetic Acid: 420 µg/L Trichloroacetic Acid: 175 µg/L	The concentrations of these compounds identified in SFPUC drinking water during 1999 were below these levels.
Haloacetonitriles	Dichloroacetonitrile Trichloroacetonitrile Bromochloroacetonitrile Dibromoacetonitrile	Dichloroacetonitrile: Mutagenic and therefore potentially carcinogenic.	Dichloroacetonitrile: 56 µg/L Dibromoacetonitrile: 161 µg/L	The concentrations of these compounds identified in SFPUC drinking water during 1999 were below these levels.
Halopicrins	Chloropicrin	Death at high doses through inhalation or ingestion. Inhalation results in injury to lungs and nose.	No levels identified	
Chlorate/Chloride	Chlorate Chloride	Adverse effects on the blood. Chlorate has additional health effects, including abdominal pain, diarrhea, coma, and at high enough concentrations will cause death.	Chlorate: 24 µg/L Chloride: 24 µg/L	

a Safe levels for drinking water are established on the basis of toxicity tests and assuming that an adult will consume two liters of water per day except where noted.
b It is estimated that the risk of getting cancer from consumption of this concentration in water would result in a cancer risk of one in 10 million.
c µg/L: micrograms per liter, equivalent to parts per billion
d It is estimated that the risk of getting cancer from consumption of this concentration in water would result in a cancer risk of one in a million.
e This level assumes consumption of five glasses of water per day.

SOURCES: SFPUC, 1998; SFPUC, undated

TABLE IV.E-3
SUMMARY OF IMPACTS – PUBLIC HEALTH AND WATER SUPPLY

Impact	CDD System	BAWUA Member Agency Systems
Increased reliability	B	B
Change in taste and odor	B	B
Effects on dialysis patients	LS	LS
Aquarium and pond impacts	LS	LS
Effects on sensitive users	LS	LS
BAWUA system impacts	NA	LS

SM = Significant Impact, can be Mitigated
LS = Less than Significant Impact
PSM = Potentially Significant Impact, can be Mitigated
SU = Significant Unavoidable Impact
B = Beneficial
N/A = Not Applicable

Based on the significance criteria described above, this increased reliability and improvement in public health protection would be a beneficial impact of the proposed project.

Change in Taste and Odor

Conversion to chloramination would result in an increase in the net level of residual disinfectant in drinking water, and there could be noticeable changes in the taste and odor of the water, including a potential decrease in the chlorinous taste and odor of existing chlorinated drinking water. Some customers may not notice these changes, while others may consider the change an improvement. Consumers from other utilities report that chloramines improve the taste and odor of drinking water. Chloramines have been proven effective in reducing taste and odor problems (AWWA, 1993). The changes in taste and odor would not create a potential public health hazard, and some people may consider the taste and odor an improvement over the current drinking water. Therefore this impact would be considered beneficial.

Effects on Dialysis Patients

With one exception, the conversion to chloramination would not result in adverse effects on human health. The levels of residual chloramines that would remain in the drinking water are effective in controlling bacterial contamination but are harmless to humans. It is safe to drink chloraminated water because the digestive process neutralizes the toxicity of chloramine before it enters the blood stream. Similarly, it is safe for cooking, bathing, and everyday uses. It is also completely safe to use chloraminated water on cuts and wounds.

The one exception is that chloraminated water can be toxic to humans if it enters directly into the bloodstream, which could occur during the kidney dialysis process. Therefore, the conversion would affect home dialysis patients as well as dialysis treatment centers. Dialysis patients can safely drink, bathe, and cook with chloraminated water; it is only necessary to remove the chloramines from water that is used during the dialysis process.

The California Department of Health Services (DHS) has established procedures for ensuring that dialysis facilities employ approved methods for removal of chloramines from water used in dialysis. Prior to systemwide conversion to chloramine, the dialysis centers that use SFPUC water are required to comply with DHS regulations for dialysis facilities. The DHS would inspect and regulate hospitals and medical centers that provide dialysis services, and must certify that dialysis facilities within the SFPUC service area have adequate treatment and operational procedures in place prior to startup of the chloramine system. The SFPUC cannot start chloramination until the DHS has certified that all dialysis facilities are in compliance.

Home dialysis patients would need to treat the chloraminated water before using it in kidney dialysis machines. Chloraminated water can be treated with ascorbic acid or a granulated activated-carbon treatment, as specified by the DHS. Physicians can recommend the most appropriate treatment, and often home dialysis service companies are available to help.

The SFPUC will conduct a formal outreach program as part of the proposed project to notify, inform, and help prepare its customers. The outreach program will target kidney dialysis facilities (as required by the DHS). The SFPUC and DHS will coordinate closely with dialysis patients and facilities to ensure a safe conversion process, and the SFPUC will provide assistance to these facilities on how to treat the water to maintain a safe level of public health protection. (See Section II.D, Public Outreach Program, for a further description.)

Because the SFPUC cannot start chloramination until all dialysis facilities and related health facilities are in compliance with DHS regulations, dialysis patients would not be affected, and this impact would be considered less than significant.

Hazards to Aquarium and Pond Owners

Chloraminated water is just as safe as chlorinated water for plants and animals that do not live in the water; chloramine (like chlorine) is toxic to freshwater and saltwater fish, reptiles, and amphibians that take water directly into the bloodstream through their gills. Therefore, these animals must be protected. Chloramine is more persistent than chlorine and will stay in water for several weeks; boiling, using salts, or letting water sit for a few days are not effective methods for removing chloramine. Chloramine has to be removed from tap water used in aquariums and ponds to assure the water is safe for aquatic life. Household, restaurant, and commercial fish tank owners would need to upgrade their current chlorine treatment process to treat for chloramine. Similarly, museums or zoos with live animals that take water directly into their bloodstream would need to take appropriate precautions.

Based on the significance criteria for public health (described above) and for biological resources (see Section IV.C), this effect would not be considered significant. However, to minimize the hazards to aquarium and pond owners, the SFPUC would conduct a formal outreach program as part of the proposed project to notify, inform, and help prepare its customers. The appropriate water treatment products or carbon filtration equipment for removing chlorine and ammonia are available in most pet and aquarium stores.

The SFPUC's outreach program will provide information to the general public, and components of the program will target aquarium and pond owners and other sensitive users. In addition, the SFPUC will hold a series of workshops for industries that need assistance on how to remove chloramine from their water. Outreach to the public will begin about one year prior to conversion. The SFPUC would use a variety of media (e.g., newspaper, television, radio, mailings, etc.) to inform water users, and outreach materials would be available in several languages. Implementation of this outreach program would reduce disruption to aquarium and pond owners as well as other sensitive users.

Effects on Sensitive Users

Certain businesses that rely on tap water as part of normal operations could be affected by changes in water quality associated with the conversion to chloramination. These businesses include:

- Laboratories, pharmaceutical manufacturers, rubber products manufacturers, microchip manufacturers, breweries, and photography labs that use tap water in their manufacturing processes. These businesses would need to review anticipated changes in water quality to identify any necessary steps to ensure their process water meets individual requirements.

- Commercial businesses such as plumbing supply/distributors. After conversion to chloramination, rubber parts on some household plumbing and water heaters may degrade more quickly than usual. Plumbing supply stores and distributors would need to provide further information and assistance to customers.

- Swimming pool maintenance and supply companies. As with chlorinated water, pool owners would need to maintain the same chlorine residual as before to prevent algal and bacterial growth in swimming pools. Pool supply stores and maintenance firms would need to provide pool owners with further information.

Based on the significance criteria for public health, this effect would not be considered significant. However, to minimize the effects to sensitive users, the SFPUC plans to hold a series of informational workshops for industries on methods for removing chloramine from their water. The public outreach program, described above, would reduce disruption to sensitive users. Potential effects on sensitive users would be less than significant.

BAWUA Member Agencies' Systems

The SFPUC's CDD provides water to customers within the City and County of San Francisco and relies exclusively on SFPUC water. Some of the member agencies of the BAWUA, however, use SFPUC water in combination with other water sources. Mixing chloraminated water from the

SFPUC system with chlorinated water from other sources could result in two changes to the affected BAWUA member agencies' systems (San Francisco Water Team, 1996):

- The loss of chloramine residual, which could cause microbial regrowth in the BAWUA member agencies' distribution systems. This microbial regrowth could result in a failure to meet the coliform standards for potable water supplies.

- The formation of dichloramine, which could be associated with objectionable taste and odor. The reported threshold odor and taste values for dichloramine range from 0.13 to 0.8 mg/L.

The potential problems associated with blending chloraminated water with chlorinated water can be minimized by proper engineering design and system monitoring to ensure that the recommended minimum chloramine disinfectant residual of 0.2 mg/L is maintained throughout the distribution system and that dichloramine concentrations are limited to less than 0.2 mg/L. Maintaining 0.2 mg/L disinfectant residual would control microbial regrowth to meet drinking water regulations. The target dichloramine concentration of 0.2 mg/L is slightly higher than the lower published threshold value for taste and odor and is expected to alleviate most taste and odor concerns for water customers (San Francisco Water Team, 1996). The SFPUC would meet drinking water regulations for disinfectant residuals for water that is delivered to BAWUA customers, which would minimize the potential for microbial regrowth throughout the distribution system, as well as control dichloramine concentrations. As with the SFPUC, the BAWUA member agencies would be required to meet drinking water regulations prior to distributing water to their customers. Therefore, since the SFPUC and BAWUA member agencies are required to meet drinking water regulations, the proposed project would not contaminate a public water supply nor create a potential public health hazard. This impact would be less than significant.

To prevent the problems associated with blending chloraminated water with chlorinated water, individual BAWUA member agencies should conduct a comprehensive evaluation of their individual systems to determine the physical and/or operational modifications needed to maintain compliance with state and federal drinking water standards. In particular, agencies that rely on SFPUC water in combination with other water sources should evaluate and address potential problems associated with loss of chloramine residuals and formation of dichloramine to prevent microbial regrowth and taste and odor concerns. BAWUA member agencies should be prepared to implement recommended modifications to their systems prior to chloramine conversion. The SFPUC would offer to provide coordination and education to assist the BAWUA agencies in planning and preparing for the conversion, thereby minimizing the impacts to customers throughout the SFPUC service area. These recommended improvement measures are also described in Section V.N of the mitigation measures chapter.

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F. AESTHETICS

The Initial Study for this project evaluated the potential aesthetic or visual quality impacts associated with development of project-related facilities (see Appendix A). Potential aesthetic impacts associated with construction and operation of proposed facilities were determined to be less than significant at all facility locations except the Pulgas and San Antonio Pump Station sites. Therefore, this EIR does not provide further discussion of aesthetic impacts associated with proposed facilities at the Tesla Portal, Alameda East and West Portals, and Harry W. Tracy WTP sites. The Initial Study determined that the proposed facility at the San Antonio Pump Station site could degrade views from nearby recreational uses and from Calaveras Road. The Initial Study also determined that the proposed dechloramination facility at the Pulgas site could be visible from Cañada Road and from the public parking lot associated with the temple. This section provides a more detailed impact assessment of potential aesthetic impacts at the San Antonio Pump Station and Pulgas sites.

1.0 REGIONAL SETTING

The project sites contain visual resources representative of California's northern Coast Ranges and inland valley landscapes. These visual elements include expansive, grass-covered grazing lands; steep, rolling hills and narrow ravines; broad valleys and prominent ridges; meandering, tree-lined creeks and drainages; and woodlands. Peaks and ridgelines of nearby hills are visually prominent landform features.

1.1 SAN ANTONIO PUMP STATION SITE

The San Antonio Pump Station site is in a rural area of the Sunol Valley. The site, located west of Calaveras Road and the existing San Antonio Pump Station facility, is generally flat and contains shrubs, grassland, and a few trees. The site is undeveloped, but does not exhibit a pristine character, since the vegetation is disturbed and debris is scattered across the site. A chain-link fence extends along the eastern boundary and separates the site from the San Antonio Pump Station. The facilities at the pump station include one large building that contains storage tanks, two small outbuildings, and a generator. These structures have an industrial appearance and are dominant visual features in the site vicinity. Surrounding lands to the north, south, and west are used for mining and nursery uses and give the project area an industrial/agricultural character. Undeveloped SFPUC watershed land is located along the east side of Calaveras Road. Beyond the immediate project area, forested hills to the east and west provide strong visual features in background views.

The San Antonio Pump Station site is visible from Calaveras Road, a designated scenic road in the *East County Area Plan* (Alameda County, 1993). Views of the site are also available from surrounding lands to the north, south, and east that are currently used for agriculture and mining. Long-range views of the project site are available from undeveloped, forested hills within the Alameda Watershed to the west of the site. As stated in Section IV.B, Land Use and Recreation, the site is within one mile of a proposed regional trail that would extend along these hills.

However, an alignment for this trail has not been selected, and there are no immediately foreseeable plans to begin construction.

1.2 PULGAS SITE

The proposed dechloramination facility site is located west of Cañada Road in a generally undeveloped area near the Crystal Springs Reservoir. The site, which contains open grassland, gently slopes down toward the west, away from Cañada Road. A dense stand of trees provides a strong visual feature along the northern site boundary and separates the site from a public parking lot. Trees and shrubs also extend along the eastern edge of the site at Cañada Road. On the west and south sides, the site tends to merge visually with the pattern of surrounding grassland. Undeveloped, forested hills within SFPUC watershed land provide strong background features to the west.

The proposed 30-foot-wide pipeline construction corridor would extend from the proposed dechloramination facility site north through the public parking lot and the landscaped area east of the Pulgas Water Temple (see Figure III.15). The proposed pipeline construction corridor is visible from the public parking lot, Cañada Road, and the Pulgas Water Temple.

The Pulgas Water Temple, which consists of a Roman Renaissance–style, columned structure and a reflecting pool surrounded by manicured lawns, is a unique and prominent visual feature in the project area. The Pulgas Water Temple is included in the California Inventory of Historic Resources (see Section IV.G, Cultural Resources). As stated in Section IV.B, Land Use and Recreation, the Pulgas Water Temple is open to the public and is available for weddings.

The proposed dechloramination facility site is visible from Cañada Road, which is a designated scenic road in the *San Mateo County General Plan* (1986). As stated in Section IV.B, Land Use and Recreation, the segment of Cañada Road near the Pulgas site is closed to vehicular traffic on Sundays to encourage recreational uses such as bicycling, rollerblading, and walking. Surrounding lands to the south and west are SFPUC watershed lands which, although they afford views of the site, are not accessible to the public. To the north, partial views of the site are available from the temple parking lot, but the stand of trees along the northern site boundary provides screening. Views of the site are not available from the Pulgas Water Temple, which is about 700 feet north of the project site and the adjacent parking lot, due to intervening vegetation.

Long-range views of the site from vantage points to the north, south, east, and west, including Skyline Boulevard (approximately two miles to the west) and the Filoli Estate House and Gardens (approximately one mile to the south), are obstructed by intervening terrain and vegetation. Views from I-280 are also screened by intervening terrain.

1.3 SCENIC CORRIDORS

Scenic roads were identified based on designation in appropriate county plans as scenic routes. The following scenic roads are located in the vicinities of the Pulgas site and the San Antonio Pump Station site.

Calaveras Road

Calaveras Road is a designated scenic road in Alameda County's *East County Area Plan* (1993). Calaveras Road is located in a relatively narrow valley (Alameda Creek) that widens to form the Sunol Valley at the confluence of Alameda Creek, San Antonio Creek, and Arroyo de la Laguna. The valley floor is agricultural in character, with a variety of nurseries, vineyards, and dry land farming. As Calaveras Road enters the Sunol Valley, where the San Antonio Pump Station is located, the most visible land uses are the nurseries located west of the road. Sand and gravel mining operations are also visible but are not as noticeable from the road as the many acres of boxed specimen trees associated with the nurseries.

Cañada Road

Cañada Road is a designated scenic road in the *San Mateo County General Plan* (1986). Cañada Road extends generally north to south along the east side of the Pulgas site. Cañada Road offers a relatively quiet bypass to I-280 for leisurely driving and is a popular recreational bicycle route. The road is closed on Sundays to automobile traffic by the San Mateo County Parks and Recreation Department between Edgewood Road and State Route 92 for exclusive recreational use by runners, hikers, and bicyclists. Cañada Road offers extensive views of the forested Santa Cruz Mountains, the grass-covered hills on the east side of the valley, Upper Crystal Springs Reservoir, and the Pulgas Water Temple.

As stated in Section IV.A, Plans and Policies, and Section IV.B, Land Use and Recreation, the Golden Gate National Recreational Area (GGNRA) administers a Scenic Easement and a Scenic and Recreation Easement that cover nearly all of the SFPUC-owned Peninsula Watershed lands. In the project area, the Scenic Easement includes the lands west of Cañada Road, whereas the Scenic and Recreation Easement includes land to the east of Cañada Road. The proposed dechloramination facility site is within the GGNRA Scenic Easement.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for visual quality, but it generally considers that implementation of the proposed project would have a significant effect on visual quality if it were to:

- have substantially negative aesthetic effects;
- substantially degrade or obstruct scenic views from public areas; or
- produce substantial light or glare.

2.2 IMPACTS

Summary of Impacts By Project Component

Table IV.F-1 provides a summary of the aesthetic impacts associated with specific components of the proposed project and their respective level of significance. The table includes results of the impact assessment from the Initial Study, and thus impacts for all sites are shown. As described above, this impact section addresses aesthetic impacts at the San Antonio Pump Station and the Pulgas sites only; discussion of the remaining sites is provided in the Initial Study (see Appendix A).

TABLE IV.F-1
SUMMARY OF IMPACTS – AESTHETICS

		Sunol Valley Sites			Pulgas Sites			
Impact	**Tesla Portal Site**	**San Antonio Pump Station Site**	**Alameda East Portal Site**	**Alameda West Portal Site**	**Pulgas Site**	**Pulgas Balancing Reservoir Site**	**Harry W. Tracy WTP Site**	**Secondary Discharge Locations**
Negative aesthetic effect	LS	LS	LS	LS	PSM	LS	LS	N/A
Degradation or obstruction of scenic views	LS	LS	LS	LS	PSM	LS	LS	N/A
Production of substantial light or glare	LS	LS	LS	LS	LS	LS	LS	N/A

SM = Significant Impact, can be Mitigated
LS = Less than Significant Impact
PSM = Potentially Significant Impact, can be Mitigated
SU = Significant Unavoidable Impact
B = Beneficial
N/A = Not Applicable

Negative Aesthetic Effects

San Antonio Pump Station Site

The proposed ammonia and chlorine feed system would be located in a currently undeveloped area west of the San Antonio Pump Station. The visual character of the site would change from rural to industrial by replacing disturbed grassland and shrubs with a 30-foot-tall building. The new building would be comparable in size and character to the existing building at the San Antonio Pump Station.

While the site is currently undeveloped, construction of a new ammonia and chlorine feed facility would not adversely affect the overall visual character of the project area. While the surrounding

tree-covered hills provide scenic features, the project site and surrounding low-lying lands currently exhibit an industrial character. The project site is adjacent to existing industrial facilities and structures at the San Antonio Pump Station. Therefore, introduction of a new ammonia and chlorine feed system to the area would not substantially alter the visual character. This impact would be less than significant.

Pulgas Site

Dechloramination Facility. Construction of the proposed dechloramination facility at the Pulgas site would alter the appearance of the site by placing a 30-foot-tall building (maximum height) and an access road on a currently undeveloped meadow. Depending on the final architectural design, the proposed building would likely exhibit an industrial character that would contrast with undeveloped SFPUC watershed lands to the south and west. The currently undeveloped character of the site provides a visual linkage to the watershed lands. Construction of the proposed building would introduce a non-natural feature into a scenic, rural area where little development currently exists.

Additionally, construction of the access road for the dechloramination facility would require the removal of several mature oak trees. These trees are considered a scenic feature along Cañada Road. Removal of these trees would further reduce the visual character of the site and increase the prominence of the proposed dechloramination facility. Therefore, development of the dechloramination facility and the access road and removal of the mature trees along Cañada Road would be considered a potentially substantial negative aesthetic effect. Appropriate facility design, landscaping, and screening treatments would reduce the visual impact to less than significant, as described below and in Section V.F of the mitigation measures chapter.

As part of the design process, structures on City property are subject to review and approval by the San Francisco Arts Commission. This review process considers the appropriateness of a project's design in the context of its environment. The review process evaluates the project's design, scale, and massing for accessibility, safety, and aesthetic merit, and the process includes opportunity for public comment.

Impacts on the site's visual character would be reduced by implementing a revegetation plan, as described in Section V.F, and by painting the proposed building low-glare colors that blend with the terrain. These measures would partially integrate the building with its surroundings. Additional mitigation measures are recommended, including either construction of a decorative gate for more effective screening or relocation of the access road, to reduce the substantial negative aesthetic effects (see Section V.F). Implementation of the recommended measures in addition to the City's design review process would reduce this impact to less than significant.

Diversion Pipeline. Construction of the pipeline would require the excavation of a 30-foot-wide trench through the parking lot and manicured lawns at the Pulgas Water Temple. The work would also require removal of mature trees adjacent to the proposed dechloramination facility and the parking lot. Trench construction and tree removal would result in a potentially significant, negative aesthetic effect associated with loss of vegetation. Mitigation measures to prepare and

implement a landscaping plan are proposed in Section V.F to reduce visual impacts of construction activities to less than significant levels.

During construction, excavated trenches and stockpiled soils, pipe, and other materials within the construction easement would constitute negative aesthetic features. This would be a temporary adverse impact, lasting about 14 months, and would be considered less than significant. However, screening of construction equipment during weekends and locating staging areas behind trees or in other locations not visible from Cañada Road would help reduce this impact; these measures are described in Section V.N.1.0, Land Use, in the mitigation measures chapter.

Following construction, the proposed pipeline would be entirely below grade and would be unobtrusive. With the exception of possible vegetation removal discussed above, no long-term visual impacts would result from installation of the pipeline.

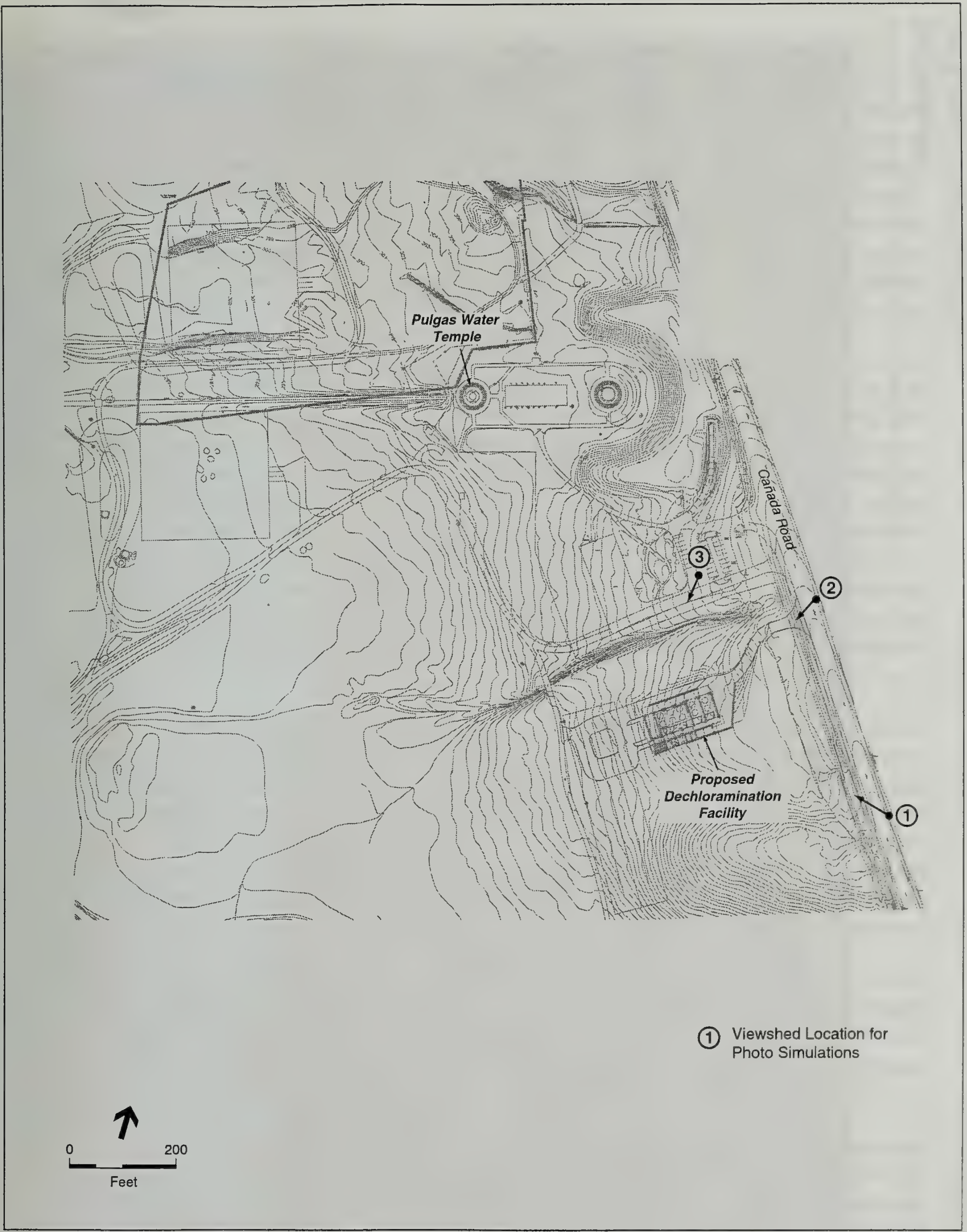
Degradation or Obstruction of Scenic Views from Public Areas

San Antonio Pump Station

Views of the proposed San Antonio Pump Station site from Calaveras Road would be changed as a result of the project. The proposed ammonia and chlorine feed facility would extend the existing industrial features at the San Antonio Pump Station onto undeveloped land to the west, but would not constitute a significant adverse effect on views. The proposed building would be similar in size and character to the existing San Antonio Pump Station, which is a prominent visual feature within the Calaveras Road view corridor. Furthermore, the San Antonio Pump Station is between the proposed building and Calaveras Road. The pump station is a prominent feature that would screen direct views of the proposed facility. Therefore, development of the proposed facility is not expected to adversely affect views from Calaveras Road. This would be a less than significant impact, and no mitigation is required.

Pulgas Site

Dechloramination Facility. Views of the Pulgas site would be substantially changed as a result of the new dechloramination facility. Visual simulations of the proposed project were prepared to show how the facility would appear from the three public viewpoints identified in Figure IV.F-1. The visual simulations are based on conceptual design and represent the worst-case scenario by illustrating the maximum building mass combined with maximum tree removal; actual building size and tree removal could be less. The simulations also do not provide a representation of proposed landscaping or the security gate/fencing, both of which would screen views of the proposed site, but which have not yet been designed. Viewpoints 1 and 2 are representations of maximum views of the project along approximately 500 feet of Cañada Road, where the site would be visible to people driving, bicycling, or walking by that area, although views of the facility would not be available from most of Cañada Road in the vicinity of the Pulgas Water Temple. Viewpoint 3 represents maximum views of the site from the parking lot at the Pulgas Water Temple.



SOURCE: Environmental Science Associates, 2000;
Yuki A. Kawaguchi, 2000

1998.898E: Hetch Hetchy Water Treatment Chloramine Conversion Project EIR / 990095

Figure IV.F-1
Pulgas Site Viewshed Map

As shown in Figures IV.F-2 (current view) and IV.F-3 (simulation of future view), and Figures IV.F-4 (current view) and IV.F-5 (simulation of future view), the proposed facility could be a prominent visual feature in short-range views from Cañada Road to the east and southeast. Virtually no development is currently visible along the Cañada Road corridor in the project area. The facility would introduce a non-natural focal point and reduce the amount of visible open space in these views looking from the south of the proposed site. This could substantially degrade scenic views from public areas and, depending on final design and landscaping, would be considered a potentially significant, adverse impact unless appropriate mitigation measures were implemented.

Opportunities for screening the proposed facility from Viewpoint 2 (shown in Figures IV.F-4 and IV.F-5) are limited, since the proposed access road would require removal of about five mature trees along Cañada Road. Without implementing a screening and berming strategy, the construction areas and the proposed facility would be clearly visible from Cañada Road across the entrance to the access road. However, implementation of mitigation measures presented in Section V.F to reduce visual intrusion would reduce this impact to less than significant. These measures include construction of a decorative gate at the entrance to the road to help screen views of the facility from this viewpoint and implementation of a landscape plan. If designed appropriately, the gate and landscaping would reduce this impact to a less than significant level. Further study of the proposed alignment of the access road should also be conducted to identify any adjustments that would minimize the removal of existing trees that serve to screen the site from Cañada Road.

As shown in Figures IV.F-2 and IV.F-3, the top of the proposed 30-foot-tall (maximum) building would be visible from Viewpoint 1. The building would not be as visually prominent in this view as it would be from Viewpoint 2. Existing vegetation would screen the bottom portion of the building. To reduce visual intrusion, the design for the proposed building would incorporate architectural elements (e.g., slanted roof) that minimize the industrial appearance of the building and make it more compatible with the rural setting of the area. Implementation of the mitigation measures presented in Section V.F would reduce impacts from this viewpoint to a less than significant level.

As shown in Figures IV.F-6 and IV.F-7, views of the proposed facility from the Pulgas Water Temple parking lot are partially screened by vegetation. Therefore, the building would not be as visually prominent as it would be in views from Cañada Road. Implementation of mitigation measures presented in Section V.F would visually integrate the building into its surroundings and would reduce impacts to views from the parking lot to less than significant levels.

Diversion Pipeline. Construction of the proposed pipeline would require excavation of deep trenches, and pipe and fill materials would be stored along or near the alignment. The pipeline construction corridor would be visible from Cañada Road, a designated scenic corridor, as well as from the Pulgas Water Temple, a popular recreation area. This would be an adverse but temporary impact and therefore less than significant. As stated above, no long-term visual impacts from installation of the pipeline would remain following construction. However, some mature trees would be removed along the alignment. (The removal of mature trees is evaluated

SOURCE: Environmental Science Associates, 2000;
Yuki A. Kawaguchi, 2000

See Figure IV.F-1 for viewshed location

1998.898E: Hetch Hetchy Water Treatment Chloramine Conversion Project EIR / 990095 ■

Figure IV.F-2
Pulgas Site from Cañada Road,
Existing Photo, View 1

SOURCE: Environmental Science Associates, 2000;
Yuki A. Kawaguchi, 2000

Note: Details shown area for scale only

See Figure IV.F-1 for viewshed location
See Figure IV.F-2 for existing photo

1998.898E: Hetch Hetchy Water Treatment Chloramine Conversion Project EIR / 990095

Figure IV.F-3
Block Diagram of Pulgas Dechloramination Facility from Cañada Road, View 1

SOURCE: Environmental Science Associates, 2000;
Yuki A. Kawaguchi, 2000

See Figure IV.F-1 for viewshed location

Figure IV.F-4
Pulgas Site from Cañada Road,
Existing Photo, View 2

SOURCE: Environmental Science Associates, 2000;
Yuki A. Kawaguchi, 2000

See Figure IV.F-1 for viewshed location
See Figure IV.F-4 for existing photo

Note: Details shown are for scale only.
Architectural treatment, landscaping, and security gate not shown.

Figure IV.F-5
Block Diagram of Pulgas Dechloramination Facility from Cañada Road, View 2

SOURCE: Environmental Science Associates, 2000;
Yuki A. Kawaguchi, 2000

See Figure IV.F-1 for viewshed location

1998.898E: Hetch Hetchy Water Treatment Chloramine Conversion Project EIR / 990095

Figure IV.F-6
Pulgas Site from Public Parking Lot,
Existing Photo, View 3

SOURCE: Environmental Science Associates, 2000;
Yuki A. Kawaguchi, 2000

Note: Details shown are for scale only

See Figure IV.F-1 for viewshed location
See Figure IV.F-6 for existing photo

1998.898E: Hetch Hetchy Water Treatment Chloramine Conversion Project EIR / 990095

Figure IV.F-7

Block Diagram of Pulgas Dechloramination Facility, from Public Parking Lot, View 3

above.) Mitigation measures presented in Sections V.F and V.G to restore disturbed areas would assure that short-term construction disturbance would not result in long-term visual impacts; implementation of these measures would reduce impacts on views along the pipeline alignment to a less than significant level.

Produce Substantial Light or Glare

San Antonio Pump Station Site

Exterior security lighting at the proposed ammonia and chlorine feed facility would be evident in views from Calaveras Road as well as from surrounding industrial and agricultural uses. This lighting would not affect nighttime views from residential areas, but would increase the amount of light and glare visible from Calaveras Road. This would not be considered significant, since scenic views from Calaveras Road are not visible at night, and proposed lighting would not interfere with daytime views available to recreational users and motorists traveling along Calaveras Road. Therefore, installation of security lighting at the proposed facility would result in a less than significant impact. While no mitigation is required, it is recommended that lighting be directed downward and that the lighting installed be the minimum necessary for security and operations. Energy-efficient, low-wattage light fixtures should be used. SFPUC should consider using light fixtures with timers or separate switches to minimize lighting effects.

Pulgas Site

Dechloramination Facility. Exterior security lighting at the proposed dechloramination facility would be evident in views from Cañada Road and the Pulgas Water Temple parking lot. This lighting would not affect nighttime views from residential areas, but would increase the amount of light and glare visible from Cañada Road. This would be a less than significant impact, since no recreational use of the area occurs after dark. While not required to mitigate a significant impact, it is recommended that lighting be directed downward and that the lighting installed be the minimum necessary for security and operations. Safety lighting should be provided at the entry gate, the access road, and the parking area. Energy-efficient, low-wattage light fixtures should be used. SFPUC should consider using light fixtures with timers or separate switches to minimize lighting effects.

Diversion Pipeline. Since the pipeline alignment would be entirely below grade, no exterior lighting would be installed, and no reflective building materials would be visible. Therefore, the proposed pipeline would not introduce new sources of light or glare.

REFERENCES – Aesthetics

Alameda County, *East County Area Plan*, 1993.

San Mateo County, *San Mateo County General Plan*, 1986.

G. CULTURAL RESOURCES

The Initial Study for this project evaluated the potential cultural resources impacts associated with development of project facilities (see Appendix A). The Initial Study determined that potential impacts on archaeological or historic resources could result from construction and operation of proposed facilities at all locations. Therefore, this section evaluates potential impacts on archaeological or historic resources at all facility locations, as well as potential impacts on the historic integrity of the Pulgas Water Temple. Potential impacts on recreational uses are discussed in Section IV.B, Land Use and Recreation.

Cultural resources include prehistoric and historic archaeological sites, districts, and objects; standing historic structures, buildings, districts, and objects; and locations of important historic events, or sites of traditional or cultural importance to various groups. The analysis of cultural resources can provide valuable information on the cultural heritage of both local and regional populations. CEQA requires review to determine if a project would have a significant effect on archaeological sites, or a property of historic or cultural significance to a community or ethnic group, that are eligible for inclusion in the *California Register of Historical Resources* (CRHR).

This section identifies cultural resources that could be affected by the proposed project. The significance of potentially affected resources is assessed, and measures to mitigate any such adverse effects are discussed below and presented in detail in Chapter V. The *Cultural Resources Background Report* prepared for this project (Basin Research Associates, 1999) presents a detailed description of the cultural resources associated with the proposed project. Appendix D of this document identifies and reviews applicable cultural resources laws and regulations.

1.0 SETTING

1.1 HISTORIC OVERVIEW AND SIGNIFICANCE OF THE SAN FRANCISCO WATER SYSTEM

The evaluation of system resources must occur within both a general systemwide as well as a local context. Although the San Francisco Water System is not listed on the CRHR and has not been evaluated or determined eligible for the *National Register of Historic Places,* research suggests that the system may be eligible for the CRHR. Therefore, this section provides a systemwide context for the overall SFPUC water system so that the potential cultural significance of individual parts of the system can be evaluated, both in terms of the entire system as well as on an individual, site-specific basis. More detail on the history of the San Francisco Water System is provided in the *Cultural Resources Background Report* (Basin Research Associates, 1999).

Based on preliminary research, three CRHR criteria may qualify the San Francisco Water System for inclusion in the register. The SFPUC water system may: (1) be associated with events that have made a significant contribution to the broad patterns of local or regional history,

or the cultural heritage of California or the United States; (2) be associated with the lives of persons important to local, California, or national history; and (3) may embody the distinctive characteristics of a type, period, region, or method of construction. However, it is beyond the scope of the proposed project to research and evaluate the eligibility of the complete system. Cultural significance of individual elements of the SFPUC water system with respect to the proposed project is discussed below.

1.2 PROJECT LOCATIONS

The cultural resources assessment for individual sites is based on an archival review, research on the Native American and historic periods, and a cultural resources review. Table IV.G-1 summarizes this information for the project sites, and more detail can be found in the *Cultural Resources Background Report* (Basin Research Associates, 1999). Results of the cultural resources review that have direct bearing on the proposed project are discussed below for each project location.

Tesla Portal Site

The Tesla Portal site may be a contributor to the San Francisco Water System, which may be eligible for the CRHR. It is the beginning of a 25-mile-long section of the 28.5-mile-long Coast Range Tunnel that extends from Tesla Portal to the Irvington Portal near Mission San Jose. The tunnel is listed in the *Historic Civil Engineering Landmarks of San Francisco and Northern California* (ASCE, 1977).

The Tesla Portal site includes seven buildings. Four buildings were originally constructed at the portal in 1936: the caretaker's house and garage, the chlorinater building, and the pump house. Valve house #1 was constructed in 1950. In 1963, the caretaker's house was remodeled, valve house #2 was built, and a small office was probably constructed. In 1967, major additions to the pump house and the chlorinater building were completed.

The small office building adjacent to the east side of the caretaker's garage is the only building at the Tesla Portal site that would be affected by the proposed project. The San Francisco Water Department real estate records do not indicate a construction date for this building. It appears likely the small office building was originally constructed for storage between 1963 and 1967 when, according to Water Department drawings, a number of construction projects occurred at Tesla Portal. The building is 12 feet by 16 feet, with a gable roof covered with asphalt shingles. Structurally, the building is stud-wall, wood-frame construction with a concrete foundation. The side roof eaves have exposed rafters, and the front and rear eaves have five evenly spaced, decorative brackets. The exterior walls are covered with smooth stucco. The center of the front (north) facade has the only door into the building. The paneled door has a six-light window. Above the front door and at the gable of the back facade are small vents. At the center of the side and back facades are modern aluminum-frame windows. The one-room interior has been recently remodeled as an office.

TABLE IV.G-1
SUMMARY OF CULTURAL RESOURCES CONDITIONS AT PROJECT LOCATIONS

Site	Archival Search	Native American Period	Historic Period	Cultural Resources Review
Tesla Portal	Archaeological and historic sites: Negative No cultural resources listed in *San Joaquin County Historic Property Directory* or GLO map series (CSU, Stanislaus, Turlock CCIC File No. 3548L)	Sacred Lands Inventory: No locations of importance Area probably occupied at one time by Luecha group	Hispanic Period: Area on land not granted American Period: Site in agricultural region, near railroad towns of Tracy and Carbona	Tesla Portal is a possible contributor to the historic features of the San Francisco Water System. [a] Field inventory noted no surface indications of historic or prehistoric resources at the site.
Sunol Valley Sites Alameda East Portal San Antonio Pump Station Alameda West Portal	Archaeological resources: Moderate potential Archaeological and historic sites: Negative No cultural resources listed for area in *Alameda County Historic Property Directory*	Sacred Lands Inventory: No locations of importance Area probably occupied at one time by Chochenyo territory of the Ohlone	Mexican Period: Area situated within Rancho Valle de San Jose No historic features or structures located in project vicinity	San Antonio Pump Station has no cultural resource significance. Alameda East and West Portals are possible contributors to the San Francisco Water System. [a] Field inventory noted no surface indications of historic or prehistoric resources at any of the sites.
Pulgas Area Sites Dechloramination Site Balancing Reservoir	Archaeological sites: None recorded in or adjacent to sites One prehistoric archaeological site, CA-SMa-147, located approximately 800 feet south of the Pulgas Water Temple	Sacred Lands Inventory: No locations of importance Area probably occupied at one time by Ramaytush subdivision of the Ohlone	Hispanic Period: Area within Rancho Las Pulgas. No sites or structures appear to be situated near sites. American Period: Part of Canada Raymundo Valley, fertile for grape growing; also known for lumbering of redwoods. No American Period resources are known to be present in project area.	Pulgas Water Temple may be eligible individually for the *California Register of Historic Resources* and/or as a possible contributor to the historic features of the San Francisco Water System. [a] Balancing Reservoir is not likely a contributor to the historic features of the San Francisco Water System. [a] Field inventory noted no surface indications of historic or prehistoric resources at any of the sites.

TABLE IV.G-1 (Continued)
SUMMARY OF CULTURAL RESOURCES CONDITIONS AT PROJECT LOCATIONS

Site	Archival Search	Native American Period	Historic Period	Cultural Resources Review
Pulgas Area Sites (cont.)	Pulgas Water Temple is a "Reported Cultural Resource" and is on the *California Inventory of Historic Resources*. Also listed on *Historic Sites Master List for San Mateo County*			
Harry W. Tracy WTP	Archaeological and historic sites: Negative No cultural resources listed in *San Mateo County Historic Property Directory*	Sacred Lands Inventory: No locations of importance Area probably occupied at one time by Ramaytush subdivision of the Ohlone	Historic site of Portola Camp near San Andreas Reservoir Hispanic and Mexican Period: Site was a cattle ranch that supplied the Presidio; temporary rancho grant American Period: Nearby San Andreas Dam historic site	Harry W. Tracy WTP not a likely contributor to the historic features of the San Francisco Water System. [a] Field inventory noted no surface indications of historic or prehistoric resources at the site.

[a] Based on preliminary research, the San Francisco Water System may be eligible for the *California Register of Historical Resources*.

SOURCE: Basin Research Associates, Inc., 2000

The office building, given its recent construction date, does not appear to be of individual historical importance, nor a contributing feature to a potential San Francisco Water System CRHR listing. The caretaker's house and garage, which would not be affected by the project, may be contributing features to a possible CRHR listing.

A site visit to the proposed project area was conducted on August 16-17, 1999, and no indications of significant historic or prehistoric resources were noted on the surface. The area in the vicinity of a tank on a small hill above the site was not reviewed due to extensive prior disturbance.

Alameda East and West Portals and San Antonio Pump Station

The San Antonio Pump Station is a recent industrial facility and has no cultural resource significance.

The Alameda East and West Portals (and shafts) are possible contributors to the San Francisco Water System, which may be eligible for the CRHR (CAL/OHP, 1997; CAL/OHP, n.d.). The location is a termination point of the 25-mile-long section of the 28.5-mile-long Coast Range Tunnel that begins at the Tesla Portal. The Alameda portals are linked to the Irvington Portal near Mission San Jose by a continuing 3.5-mile-long tunnel. The Coast Range Tunnel is listed in the *Historic Civil Engineering Landmarks of San Francisco and Northern California* (ASCE, 1977). There is no indication that the Alameda East or West Portals are individually considered to be of historic importance.

A field inventory conducted on September 14, 1999 noted no surface indications of significant historic or prehistoric resources at either the San Antonio Pump Station or the portal locations.

Pulgas Water Temple and Pulgas Balancing Reservoir

Archival Search

The Pulgas Water Temple is a "Reported Cultural Resource"; and is on file with the California Historical Resources Information System with a designated number (C-346) in the inventory system. The temple is also part of the San Francisco Water System, a California Historic Civil Engineering Landmark dedicated by the San Francisco Section of the American Society of Civil Engineers (ASCE, 1977).[1] The temple is on the *California Inventory of Historic Resources* under the theme of architecture (CAL/OHP, 1976) and among 64 geologic, scenic, and historic points of interest in San Mateo County (Brabb et al., 1982). It is also listed on the *Historic Sites Master List for San Mateo County* (SMaCo/ESA/PBD, 1999). However, the temple is not listed on the CRHR and has not been evaluated or determined eligible for the *National Register of Historic Places.*

1 This system is not listed on the *California Register of Historical Resources* and has not been evaluated or determined eligible for the *National Register of Historic Places.*

California State Landmark No. 92, the Portola Expedition Camp of November 11, 1769, is placed at the Pulgas Water Temple (CAL/OHP, 1990). This landmark is also listed on the *Historic Sites Master List for San Mateo County* (SMaCo/ESA/PBD, 1999).

The Pulgas Water Temple, built in the Roman Renaissance style, is located at the outfall of the Hetch Hetchy tunnel and provides a view of water rushing through the Hetch Hetchy pipeline. The temple represents the completion of the 136-mile journey from the Sierra Nevada mountains to Crystal Springs Reservoir. The present structure, built in 1938, replaced a temporary structure of plaster built especially for ceremonies held in October 1934 marking the completion of the Hetch Hetchy Project and the first flow of water into the San Francisco reservoirs (Brabb et al., 1982). The October 24, 1934 event included the "first gurgling water coming through the temple," which was radio broadcasted (Stanger, 1963).

Cultural Resources Review

The Pulgas Water Temple, a component of the San Francisco Water System, is adjacent to the project area. The temple may be eligible individually and/or as a contributor to a potential CRHR listing. Based on its setting, architecture, and history, as described previously in this section, the Pulgas Water Temple is considered a potentially significant historical resource.

The Pulgas Balancing Reservoir site is not likely a contributor to the historic features of the San Francisco Water System that may be eligible for the CRHR (CAL/OHP, 1997; CAL/OHP, 1999).

A field inventory conducted on September 15, 1999 noted no surface indications of significant historic and archaeological resources.

Harry W. Tracy Water Treatment Plant

The Spring Valley Water Works bought the San Andreas Valley and watershed in 1868. Nearby San Andreas Reservoir was created in 1868 by the construction of San Andreas Dam and fills most of the San Andreas Valley. This dam was the second constructed by the Spring Valley Water Works, the predecessor of the San Francisco Water System, and is a County of San Mateo Historic Site, #H-216 (Brown, 1975; CCSF, 1994; SMaCo/ESA/PBD, 1999).

The Harry W. Tracy WTP, formerly known as the San Andreas WTP, filters water from the San Andreas Reservoir. The plant has been operational since August 8, 1972 and was expanded to two filtration units in the late 1980s. The WTP was dedicated in early 1994 to the memory of Harry W. Tracy, a water quality manager and employee of the Water Department from 1937-1985 (CCSF, 1994).

Based on its date of construction, the Harry W. Tracy WTP site is not a likely contributor to the historic features of the San Francisco Water System that could make it possibly eligible for the CRHR (CAL/OHP, 1997; CAL/OHP, 1999).

A field inventory conducted on August 16, 1999 noted no surface indications of archaeological resources. The project area appears to have been graded and contoured, probably during various construction phases.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for cultural resource impacts, but it generally considers that implementation of the proposed project would have a significant effect on cultural resources if it were to:

- cause damage to, disrupt, or adversely affect a property that is listed or determined eligible by the State Historical Resources Commission for listing in the CRHR or a local register of historic resources, per Section 5020.1 of the Public Resources Code;
- cause damage to, disrupt, or adversely affect an important prehistoric or historic archaeological resource such that its integrity could be compromised or eligibility for future listing on the CRHR diminished; or
- cause damage to or diminish the significance of an important historic resource such that its integrity could be compromised or eligibility for future listing on the CRHR diminished.

2.2 IMPACTS

Table IV.G-2 provides a summary of the cultural resource impacts associated with specific components of the proposed project.

Construction Impacts to Archaeological Resources

Construction activities have the potential to directly impact unknown buried cultural resources in the project area by disturbing subsurface soils. Such disturbance could result in the loss of integrity of cultural deposits, loss of information, and the alteration of a site setting. Potential indirect impacts, primarily vandalism, could result from increased access to and use of the general area during both construction and operation. Without mitigation, construction activities could cause damage to, disrupt, or adversely affect any unknown buried cultural resources at all project sites involving excavation or soil disturbance; therefore, this impact would be potentially significant at the Tesla Portal, Alameda East Portal, San Antonio Pump Station, Alameda West Portal, Pulgas, and Harry W. Tracy WTP sites.

Overall, there is a very low potential for the inadvertent discovery of subsurface prehistoric or historic archaeological deposits at the four project locations, as described below. An archaeological presence/absence testing program prior to construction and archaeological monitoring during subsurface construction are not recommended. However, in the event that

TABLE IV.G-2
SUMMARY OF IMPACTS – CULTURAL RESOURCES

Impact	Tesla Portal Site	Sunol Valley Sites: San Antonio Pump Station Site	Sunol Valley Sites: Alameda East Portal Site	Sunol Valley Sites: Alameda West Portal Site	Pulgas Sites: Pulgas Site	Pulgas Sites: Pulgas Balancing Reservoir Site	Harry W. Tracy WTP Site	Secondary Discharge Locations
Construction impacts to archaeological resources	PSM	PSM	PSM	PSM	PSM	N/A	PSM	N/A
Construction impacts to architectural resources	LS	LS	LS	LS	PSM	LS	LS	N/A
Operational impacts to architectural resources	LS	LS	LS	LS	PSM	LS	LS	N/A

SM = Significant Impact, can be Mitigated
LS = Less than Significant Impact
PSM = Potentially Significant Impact, can be Mitigated
SU = Significant Unavoidable Impact
B = Beneficial
N/A = Not Applicable

prehistoric or historic cultural materials[2] were discovered, it is recommended that operations stop within 25 feet of the find, and that a qualified professional archaeologist be contacted. If the find were determined to be significant, treatment recommendations should be developed and

[2] Significant prehistoric cultural resources are defined as human burials, features, or other clusterings of finds made, modified, or used by Native American peoples in the past. The prehistoric and protohistoric indicators of prior cultural occupation by Native Americans include artifacts and human bone, as well as soil discoloration, shell, animal bone, sandstone cobbles, ashy areas, and baked or vitrified clays. Prehistoric materials may include:

a. Human bone - either isolated or intact burials
b. Habitation (occupation or ceremonial structures as interpreted from rock rings/features, distinct ground depressions, differences in compaction (e.g., house floors)
c. Artifacts including chipped stone objects such as projectile points and bifaces; groundstone artifacts such as manos, metates, mortars, pestles, grinding stones, pitted hammerstones; and shell and bone artifacts including ornaments and beads
d. Various features and samples including hearths (fire-cracked rock; baked and vitrified clay), artifact caches, faunal and shellfish remains (which permit dietary reconstruction), distinctive changes in soil stratigraphy indicative of prehistoric activities
e. Isolated artifacts

Historic cultural materials may include finds from the late 19th through early 20th centuries. Objects and features associated with the Historic Period can include:

a. Structural remains or portions of foundations (bricks, cobbles/boulders, stacked field stone, postholes, etc.)
b. Trash pits, privies, wells and associated artifacts
c. Isolated artifacts or isolated clusters of manufactured artifacts (e.g., glass bottles, metal cans, manufactured wood items, etc.)
d. Human remains

In addition, cultural materials including both artifacts and structures that can be attributed to Hispanic, Asian, and other ethnic or racial groups are potentially significant. Such features or clusters of artifacts and samples include remains of structures, trash pits, and privies.

could include collection/excavation, recordation, analysis, reporting, and curation of any significant prehistoric or historic cultural deposits. Implementation of the mitigation measure included in Section V.G of the mitigation measures chapter would reduce this potential impact to a less than significant level.

Tesla Portal

No recorded prehistoric or historical archaeological resources are present. No surface indications of significant archaeological resources were noted during the inventory.

San Antonio Pump Station and Alameda East and Alameda West Portals

No recorded prehistoric or historical archaeological resources are present. No surface indications of significant archaeological resources were noted during the inventory of the San Antonio Pump Station, Alameda East Portal, or Alameda West Portal project areas.

Pulgas Site and Pulgas Balancing Reservoir

No prehistoric archaeological sites have been recorded in or adjacent to the proposed project locations. No direct or indirect impacts are anticipated to prehistoric archaeological site CA-SMa-147, located approximately 800 feet south of the Pulgas Water Temple. No historic archaeological sites have been recorded in or adjacent to the proposed project locations. Historic cultural materials associated with the demolition of the original Pulgas Water Temple (1934-1938) and its subsequent reconstruction (1938) may be present in or adjacent to the project area, but this appears unlikely.

Harry W. Tracy Water Treatment Plant

The proposed facilities would be placed either in a building of recent construction or in disturbed areas next to it. No impacts are anticipated to historic resources.

Construction Impacts to Architectural Resources

Tesla Portal

The proposed facility would have no impacts to the current location setting, as it would be an addition to the ongoing use of an industrial facility that has been used, modified, and maintained for over 50 years. The proposed facility footprint would require demolition of one of the small outbuildings, now used as an office, that is associated with the current residence. The office building, given its recent construction date, does not appear to be a contributing feature to a potential San Francisco Water System CRHR listing. The caretaker's house and garage are potentially contributing features to a historic district, but these features would not be affected by the proposed project. In addition, the proposed loop road would not cause impacts to any buildings or structures. Therefore, proposed construction at this site would not affect historic or architectural resources and would be less than significant. No mitigation is required for this project component.

San Antonio Pump Station and Alameda East and Alameda West Portals

The proposed dechlorination systems at the portals would have no adverse effects on the present setting, as these facilities would either be within existing buildings or restricted to a small shed to be erected next to an existing building. Therefore, proposed construction at this site would not affect historic resources and would be less than significant. No mitigation is required for this project component.

Pulgas Site and Pulgas Balancing Reservoir

Construction activities at the Pulgas site would affect the Pulgas Water Temple setting due to construction equipment operation, temporary staging areas, and truck traffic and would be temporary, lasting up to one year. When construction is completed, the proposed dechloramination facility would ultimately be screened from the temple by landscaping; with mature landscaping, the proposed facility would not affect the temple setting. Although construction activities would have no permanent direct effects on the Pulgas Water Temple proper, construction-generated dust, noise, vibration, and other construction activities in the vicinity of the temple could result in long-term impacts to the Pulgas Water Temple and its immediate setting unless mitigated. Impacts include potential for construction dust to settle on the temple and associated structures, resulting in potential soiling and/or long-term damage to the building fabric. In addition, construction noise and vibration would have the potential to affect the building's framework and fabric. Loss of mature landscaping in the immediate vicinity of the temple along the contactor pipeline trench alignment would affect the setting of the Pulgas Water Temple. The potential for construction dust, noise, and vibration to damage the Pulgas Water Temple and the loss of mature landscaping in the immediate vicinity would be a potentially significant impact. In order to protect the built environment, controls for dust, noise, and vibration should be implemented, and it is recommended that in-place landscaping be retained to the extent feasible. Any damaged vegetation should be replaced, and disturbed land should be recontoured to match existing conditions in order to retain the setting of the temple area (see Section V.G of the mitigation measures chapter). Implementation of these measures would reduce this potentially significant impact to less than significant.

Construction and operation at the Pulgas Balancing Reservoir site under the proposed project would consist of minor modifications to existing facilities that would not affect the setting of those facilities. Therefore, proposed construction at this site would not affect historic resources and would be less than significant. No mitigation is required for this project component.

Harry W. Tracy Water Treatment Plant

The proposed facilities would be placed either in a building of recent construction or in disturbed areas next to it. No impacts are anticipated to historic buildings or structures. Therefore, proposed construction at this site would not affect historic resources and would be less than significant. No mitigation is required for this project component.

Operational Impacts to Architectural Resources

Pulgas Water Temple

The proposed project would divert the current flow of water from the channel beneath the Pulgas Water Temple to the proposed dechloramination facility and return the flow downstream of the temple. Currently, the flow of water at the temple varies depending on systemwide operational requirements and seasonal conditions, and ranges from no flow to as much as 80 million gallons daily. Even though the flow is currently intermittent, the sound of water flowing at the temple is considered a contributing feature to the setting and historic integrity of the structure. The temple was deliberately located at the outfall of the Hetch Hetchy Aqueduct to provide a view of water rushing through the pipeline, which represents the completion of a 136-mile journey from the Sierra Nevada to Crystal Springs Reservoir. Because the Pulgas Water Temple is considered a significant historical resource, removal of the flow from the Pulgas Water Temple could diminish its significance and would be considered a potentially significant impact unless mitigated.

However, as part of the proposed project, there would be provisions to retain the sound of flowing water, such as a pumping system and recirculation pipeline that would allow a reduced volume of water to flow through the temple during periods when water is released to Crystal Springs Reservoir. However, to assure that the flow is similar to the present flow, and that the pumping system and recirculation pipeline are adequate, the project should document the flow via video and audio methods, and design the proposed flow and/or pumping system to mimic the present situation (see Section V.G of the mitigation measures chapter). It is understood that the current conditions consist of a wide range of flows, from zero to considerable (and associated wide range of sound), due to operational, weather, and demand variabilities. Selection of a consistent appropriate flow and sound would be at the discretion of the SFPUC. Inclusion of these provisions as part of the proposed project would reduce this impact to less than significant.

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H. GEOLOGY AND SEISMICITY

The Initial Study for this project evaluated the potential geologic and seismic impacts associated with development of project-related facilities (see Appendix A). The Initial Study determined that potential seismic and/or geotechnical hazards could occur at all facility locations. Therefore, this section evaluates potential seismic and/or geotechnical impacts, as they pertain to each facility location.

1.0 SETTING

1.1 REGIONAL GEOLOGY

Six of the seven proposed project sites (San Antonio Pump Station, Alameda West Portal, Alameda East Portal, Pulgas, Pulgas Balancing Reservoir, and Harry W. Tracy WTP) are situated in the central portion of the Coast Ranges geomorphic province of California. The Tesla Portal site is located on the eastern border of the Coast Ranges on the hillside that defines its boundary with the Central Valley geomorphic province. The two provinces are separated by the San Joaquin fault, which lies at the base of the hill. This thrust fault dips southwest and is part of the Coast Range / Central Valley thrust belt.

Central Valley Province

The Central Valley province, to the east of the Tesla Portal site, is a large (about 20,000 square miles), northwest-southeast-trending, asymmetric structural trough filled with low permeability marine sediments that are overlain by coarser continental sediments. Along most of the eastern part of the valley, the sediments are underlain by pre-Tertiary crystalline and metamorphic rocks of the Sierra Nevada block (Davis, 1961). The western side of the valley and part of the east is underlain by a pre-Tertiary mafic and ultramafic complex (Cady, 1975). The bedrocks on the east border of the Coast Ranges consist mainly of pre-Tertiary and Tertiary semiconsolidated to consolidated clastic sediments of marine origin that have been folded and faulted. Their thickness diminishes eastward underneath the Central Valley. The marine sedimentary rocks are overlain by continental deposits of the Tulare formation in the vicinity of the Tesla Portal site.

Coast Ranges Province

The Coast Ranges province is characterized by northwest-southeast trending, subparallel ridges and valleys that are bounded by major geologic faults. The geology in this area is dominated by a complex system of strike-slip faults associated with transform motion between the Pacific and North American crustal plates. The San Andreas fault is the most important among the strike-slip faults. It separates major basement assemblages, with granitic and metamorphic basement rocks of the Salinian block to the southwest and the Franciscan assemblage to the northeast. The Franciscan assemblage is late Mesozoic in age and contains faulted blocks of graywacke, interbedded with siltstone, sandstone, shale, chert, conglomerate, greenstone, basalt, and large bodies of serpentinite. Overlying this melange, within individual valleys, are marine and

nonmarine sedimentary rocks that are from Cretaceous to Quaternary in age (USGS, 1994). Individual valleys of importance to the proposed project are discussed below.

Sunol Valley

The San Antonio Pump Station and the Alameda East and West Portal sites are located within Sunol Valley. This valley is oriented north/northwest-south/southeast; it is two miles wide at its maximum, and Alameda Creek runs northward in the valley floor. As a result of movement along the Calaveras fault, two bedrock formations—the Briones (Miocene in age) and the Panoche (Upper Cretaceous in age)—form the rugged hills on the east and west sides of the valley, respectively. The Briones formation, present on the east side of the fault, is composed of a gray marine calcareous sandstone interbedded with shale, subordinate thick beds of conglomerates, common fossil shell beds, and minor chert clasts. The Panoche formation, present on the west side of the valley, is composed for the most part of a grayish-black carbonaceous shale with dark-gray to black concretionary lenses. The shale is interbedded with brown massive sandstone and subordinate, brown, thinly laminated siltstone, shale, and local conglomerate lenses.

The Livermore formation overlies the Briones and Panoche formations throughout much of the valley. This formation is Plio-Pleistocene in age and is found almost everywhere beneath the floor of the valley, at depths ranging from a few tens of feet to over 400 feet. In Sunol Valley, this formation is composed primarily of cobbles and boulders derived from Jura-Cretaceous rocks to the south. The clasts are contained in a sandy clay matrix. The Franciscan assemblage has been identified in the vicinity of the San Antonio Pump Station.

Alluvial deposits and alluvial fan deposits overlie the Livermore formation and cover the bottom of the valley along Alameda Creek. The thickness of the alluvial deposits range from less than 20 feet to more than 100 feet in the northern portion of the valley. These deposits are unconsolidated, moderately sorted, permeable gravel, fine sand, silt, and silty clay. The gravel is more abundant toward the fan heads.

Older river terrace deposits occur on the margins of the valley bottom. They are finer grained than the alluvial deposits and are primarily composed of sand, gravel, and silt in lenses and layers. They overlie semiconsolidated deposits of the Livermore formation and also the consolidated marine deposits of the Briones and Panoche formations.

Crystal Springs Valley

The Pulgas site and Pulgas Balancing Reservoir are located within the Crystal Springs Valley. Within this valley, the Franciscan assemblage, which is Jurassic and Cretaceous in age, either outcrops or is overlain by younger geologic units.

East of the temple, the marine deposits of the Butano Sandstone overlie the Franciscan assemblage. This formation is Eocene in age and is composed of moderately consolidated but friable, grayish-orange, coarse-grained arkosic sandstone containing minor interbeds of micaceous mudstone, shale, and conglomerate (Brabb and Pampeyan, 1972).

The alluvial fan deposits of the Santa Clara formation cover the bottom of the valley south of the Pulgas site. These sediments are Pliocene and Pleistocene in age and consist of poorly sorted, moderately consolidated, tan to orange-brown conglomerate and pebbly to cobbly sand, silt, and clay. Pebbles and cobbles are angular to sub-rounded and materials are crudely stratified, probably representing old alluvial fan deposit derived mainly from graywackes and greenstones of the Franciscan assemblage.

In the vicinity of the Pulgas site and the Pulgas Water Balancing Reservoir, the weathered sandstone and shale bedrock represented by the Butano Sandstone appear to be covered by 30 to 40 feet of Holocene sediments. These are unconsolidated alluvial sediments that consist of poorly sorted gravel, sand, silt, clay, and organic matter in active modern drainage channels and small alluvial fans. These deposits grade into fine- to coarse-grained alluvial deposits, which locally interfinger with or include slope wash, ravine fill, and colluvium.

San Andreas Valley

The Harry W. Tracy WTP is located within the San Andreas Valley. In this valley, the basement rock of the Franciscan assemblage is overlain by the upper Pliocene Merced formation. This formation consists of moderately consolidated but commonly friable, yellowish to grayish-orange (where weathered) and bluish-gray (where fresh), thick-bedded to massive, fine-grained marine sandstone, siltstone, and clayey sandstone. These materials were deposited in a shallow marine and estuarine environment. The formation dips to the northeast, and the tilted, fine-grained strata might impede horizontal flow of groundwater. Generally, the Merced formation is overlain by the Colma formation, which consists largely of reworked material from the Merced formation (Schlocker, 1974). The Colma formation consists of nearly flat-lying shallow-water marine deposits of fine-grained sand, silty sand, and occasional beds of clay as much as 5 feet thick.

1.2 REGIONAL GROUNDWATER

Central Valley Basin

The Tesla Portal site is located within the San Joaquin subregion of the Central Valley groundwater basin. This subregion is located within the San Joaquin Valley, which can be conceptualized as a two-aquifer system separated by a regional confining clay layer. Within the subregion, only minor quantities of water are present in the joints and cracks of the pre-Tertiary bedrock (either the mafic complex or the crystalline metamorphic basement) that constitutes the floor of the Central Valley. Moving upward, the marine sedimentary rocks contain saline water, except in a few areas where freshwater has apparently flushed out some of the saline water (Davis and Olmsted, 1961). The continental deposits constitute the primary groundwater reservoir; the average thickness of the continental deposits is about 2,400 feet (Page, 1986).

Sunol Valley

The Sunol Valley groundwater basin encompasses two water-bearing units: the alluvial deposits of the valley floor, and the underlying Livermore formation. Within these units, groundwater is both confined and unconfined, with leakage between the upper and lower aquifers. In the northern

portion of Sunol Valley, the total thickness of these units is estimated to be in excess of 500 feet. Where the Hetch Hetchy Aqueduct crosses the valley beneath Alameda Creek through the Alameda Creek Siphons, the total thickness of alluvium is about 20 feet. Within the valley, the groundwater slopes to the northwest and is near the ground surface (CDWR, 1974). Recharge to the Sunol Valley basin occurs by infiltration of surface water along Alameda Creek. Some groundwater flows into the alluvium from the Livermore formation, but this contribution is minor.

Within the Sunol Valley groundwater basin, the Calaveras fault may restrict groundwater movement. Fine-grained fault gauge may be present along the fault plane, creating in effect a membrane of low permeability through which groundwater has difficulty moving. Studies have recently shown that the active trace of the Calaveras fault covers a narrow rupture zone, less than 10 to 20 feet wide (Simpson, et al., 1994).

Crystal Springs Valley and San Andreas Valley

Groundwater within the Crystal Springs Valley primarily occurs within the shallow continental deposits of the Santa Clara formation. Within the San Andreas Valley, groundwater primarily occurs within the younger alluvial deposits and the Colma and Merced formations; the Colma formation comprises an upper confined aquifer, and the Merced formation comprises a deeper, semiconfined or confined aquifer (Schlocker, 1974).

1.3 REGIONAL SEISMICITY

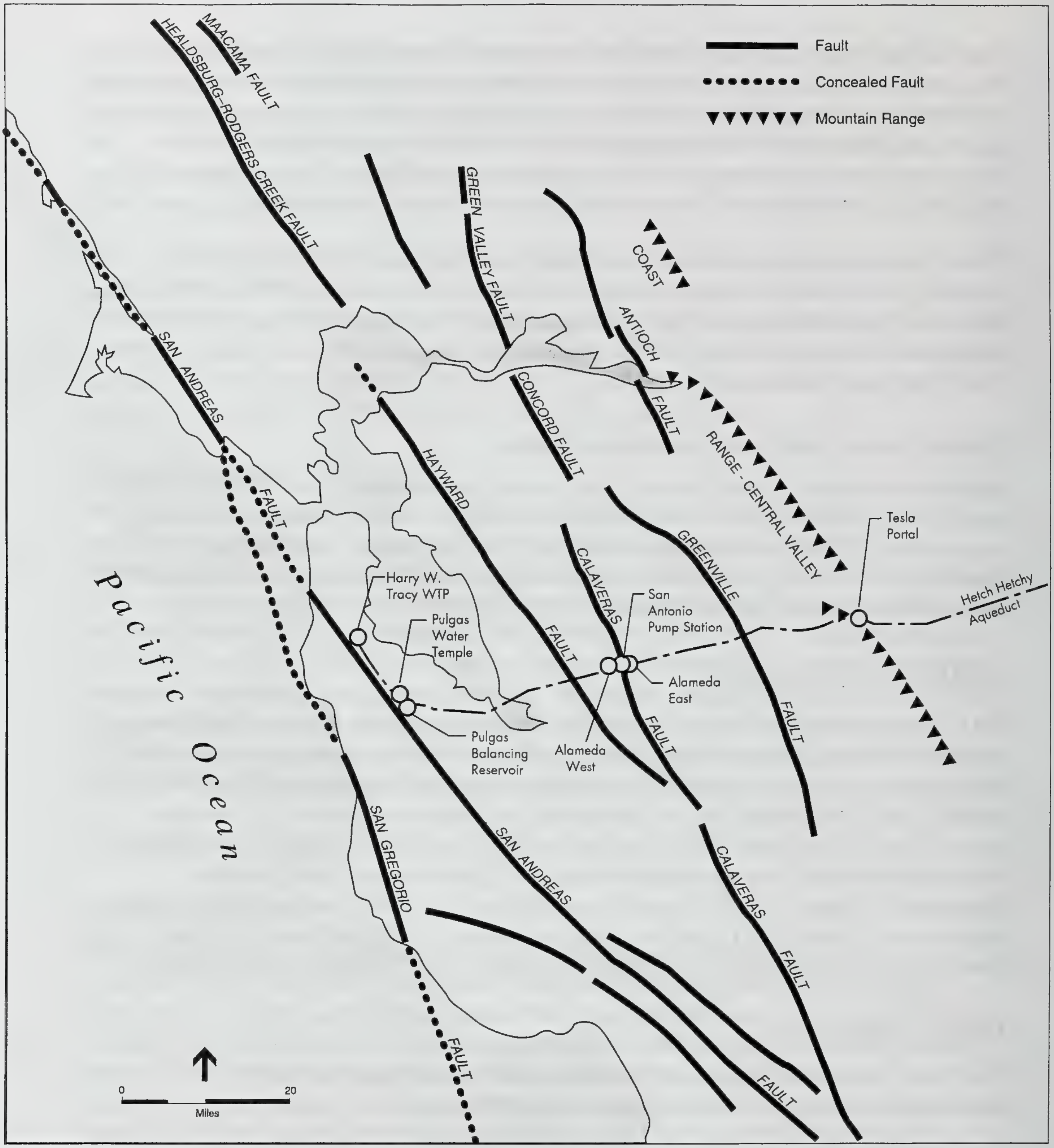
The Coast Ranges province is highly active tectonically and includes active strike-slip faults as well as active folding and thrust faulting associated with this continental margin. Active faults located within this province include the San Andreas, Hayward, Calaveras, and Greenville faults (CDMG, 1992).[1] In addition, the San Joaquin fault has been mapped by the U.S. Geological Survey during the last decade in the vicinity of the Tesla Portal (USGS, 1990). Because the San Joaquin fault is a blind thrust-fault and has no historical surface rupture, the California Department of Conservation, Division of Mines and Geology (CDMG) has not designated this fault as active. Figure IV.H-1 shows the location of the active faults, and Table IV.H-1 lists these faults with the magnitude of a characteristic earthquake that could occur along each fault.

The San Andreas Fault

The San Andreas fault is a right-lateral strike-slip fault. At least five major historical earthquakes have occurred along this fault, including the following:

- 1989 earthquake centered at Loma Prieta (Santa Cruz Mountains) with a Richter magnitude of 7.1
- 1906 earthquake centered at Golden Gate with a Richter magnitude of 7.9. Trace rupture from this earthquake followed the west side of the valley at the Pulgas site

1 Active faults are defined as faults showing evidence of Holocene age displacement (in the last 11,000 years).



SOURCE: ESA+Orion, 2000

1998.898E: Hetch Hetchy Water Treatment Chloramine Conversion Project EIR / 990095

Figure IV.H-1
Regional Fault Map

TABLE IV.H-1
REGIONAL FAULT ACTIVITY

Fault Zone	Segment Length (km)	Slip Rate (mm/yr)	Recurrence Interval[a] (years)	Recency of Faulting	Maximum Moment[b] Magnitude
San Andreas 1906 Segment	470	24 ± 3	210	Historic, Holocene	7.9
Hayward	86	9 ± 1	167	Historic, Holocene	7.1
Calaveras Northern Segment	52	6 ± 2	146	Historic, Holocene, Late Quaternary	6.8
Greenville	73	2 ± 1	521	Historic, Holocene	6.9
San Joaquin Coast Range/Central Valley Segment 9	39	1.5 ± 1	508	Historic	6.6

a Recency of faulting based on Jennings, 1994. Historic: displacement during historic time (within last 200 years), including areas of known fault creep; Holocene: evidence of displacement during the last 10,000 years; Quaternary: evidence of displacement during the last 1.6 million years.

b The moment magnitude reflects the energy released by an earthquake. It is used by modern seismologists in place of the more familiar Richter magnitude, because the Richter magnitude has difficulty differentiating the size of earthquakes with magnitudes greater than 7.5. The moment magnitude is proportional to the depth of the fault surface that has slipped and to the length of the fault. Weak faults tend to generate earthquakes with moment magnitudes of 5 and 6, while stronger faults can store up enough energy to generate earthquakes of moment magnitude of 7 or more. The Loma Prieta earthquake of October 1989 had a moment magnitude of 6.9.

km = kilometers
mm/yr = millimeters per year

SOURCES: Jennings, 1994; Peterson et al., 1996; SFWT, 1999

- 1865 earthquake centered in the Santa Cruz Mountains with a Richter magnitude of 6.3
- 1838 earthquake centered in San Juan Bautista with a Richter magnitudes of 7.5

The estimated slip rate of the Peninsula segment (which includes Crystal Springs Reservoir) is reported to be 17 ± 3 millimeters per year (mm/yr), with a recurrence interval of 400 years. A multiple rupture[2] such as the one that occurred during the 1906 earthquake would imply a slip

2 Larger earthquakes with a Richter magnitude of 6.5 or more are commonly associated with a ground surface rupture in only one area. However, in great earthquakes such as the 1906 earthquake, ground surface rupture can occur in more than one area.

rate of 24 ± 3mm/yr and a recurrence interval of 210 years. The characteristic earthquake for the Peninsula segment is expected to have a moment magnitude of 7.1 (Petersen et al., 1996).

The Hayward Fault

The Hayward fault is a right-lateral strike-slip fault associated with the San Andreas fault system. At least two major earthquakes have occurred along this fault, including the following:

- 1868 earthquake centered in the Berkeley Hills (San Leandro) with a Richter magnitude of 7.0
- 1836 earthquake centered in San Juan Bautista with a Richter magnitude of 6.5

The estimated slip rate of this fault is reported to be 9.0 ± 1 mm/yr. The characteristic earthquake on the southern segment would be expected to have a moment magnitude of 6.9, and the characteristic earthquake for the combined southern and northern segments would be expected to have a moment magnitude of 7.1. The recurrence interval for either event is 167 years (Petersen et al., 1996). Much of the slip on the fault occurs as seismic creep; nevertheless, this fault has a high level of seismicity and should be considered capable of an earthquake with a moment magnitude of 7.1.

The Calaveras Fault

The Calaveras fault is a right-lateral strike-slip fault associated with the San Andreas fault system. It is one of the largest faults in California. The relative amount of horizontal movement is not exactly known, but has been estimated to be between 3 to 13 miles. Because the prevailing dip of the fault is almost vertical or to the west, the vertical component of the fault movement is reversed and is responsible for the upward movement of the west side of the fault. At least three major earthquakes have occurred along this fault since 1800, including the following:

- 1984 earthquake centered about 16 miles east of Watsonville at Coyote Dam with a Richter magnitude of 6.2
- 1911 earthquake centered east of San Jose with a Richter magnitude of 6.6
- 1861 earthquake believed to have been centered near Dublin and San Ramon, with an estimated Richter magnitude of about 6.4

The fault crosses the Hetch Hetchy Aqueduct at Calaveras Road on the east flank of the Sunol Valley. A western splay of the fault, sometimes referred to as the Sinbad fault, has been mapped on the west side of the valley, but trenching studies conducted for this project (SFWT, 1995) and by others have failed to yield evidence of Holocene or older activity of this splay (AGS, 1999). The estimated slip rate of the Calaveras fault is reported to be 6.0 ± 2.0 mm/yr. A characteristic earthquake on this fault would be expected to have a moment magnitude of 6.8 and a recurrence interval of 146 years (Simpson et al., 1994).

The Greenville Fault

The Greenville fault is a right-lateral strike-slip fault associated with the San Andreas fault system. The 1980 earthquake is the only significant recorded movement on the fault; it was centered about four miles northeast of Livermore, where the fault crosses Altamont Pass Road. This earthquake had a Richter magnitude of 5.8 (Bedrossian, 1980). The estimated slip rate of the fault is reported to be 2.0 ± 1 mm/yr. A characteristic earthquake on this fault would be expected to have a moment magnitude of 6.9 and a recurrence interval of 521 years (Petersen et al., 1994).

The San Joaquin Fault

The San Joaquin fault, together with the Black Butte fault, is identified as segment number 9 of the Coast Range / Central Valley (CRCV) thrust belt. The entire belt is a thrust fault with a dip to the southwest. The CRCV thrust belt has exhibited a moderate level of seismicity during historic time. Eleven earthquakes have been recorded on this thrust belt since 1866, with Richter magnitudes ranging from 5.6 to 6.8 (Wakabashy and Smith, 1994). The most recent earthquake occurred in Coalinga in 1983, with a magnitude of 6.5.

The San Joaquin fault defines the western boundary of the Central Valley with the Coast Ranges, and the importance of this fault has only been recognized within the last decade. The San Joaquin fault has not had any moderate or large earthquakes during historic time; however, an earthquake with a Richter magnitude of 4.1 with five aftershocks was attributed to this fault on September 7, 1994 (USGS, 1994). Fault segmentation, inferred fault geometry, and long-term slip rates suggest that the San Joaquin fault is capable of generating a large magnitude earthquake (Peterson et al., 1996; Sowers et al., 1998). The estimated slip rate of this fault is reported to be 1.5 ± 1 mm/yr. A characteristic earthquake on this fault would be expected to have a moment magnitude of 6.6 and a recurrence interval of 508 years (Petersen et al., 1996).

1.4 REGULATORY FRAMEWORK

Alquist-Priolo Earthquake Fault Zoning Act

Surface rupture[3] is the most easily avoided seismic hazard. The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. In accordance with this act, the State Geologist established regulatory zones called "earthquake fault zones" around the surface traces of active faults and published maps showing these zones. Within these zones, buildings for human occupancy cannot be constructed across the surface trace of active faults. Each earthquake fault zone extends approximately 200 to 500 feet on either side of the mapped fault trace, because many active faults are complex and consist of more than one branch. There is the potential for ground surface rupture along any of the branches.

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3 Surface rupture occurs when the movement of a fault deep within the earth breaks through to the surface. The rupture almost always follows preexisting faults that are zones of weakness. When the rupture occurs suddenly during an earthquake, structures located along the fault trace can be extensively damaged.

Seismic Hazard Mapping Act

The Seismic Hazard Mapping Act was passed in 1990 following the Loma Prieta earthquake to reduce threats to public health and safety and to minimize property damage caused by earthquakes. While the Alquist-Priolo Earthquake Fault Zone maps show only the location of earthquake fault rupture hazards, the seismic hazard maps show areas of additional seismic hazards, including liquefaction and landslides. Such hazards can be triggered by earthquake shaking and may cause damage many miles from the faults. As of December 1999, 43 official seismic hazard zone maps showing areas prone to liquefaction and landslides had been published in California, and more are scheduled in the future. Most of the mapping has been performed in Southern California; only portions of Northern California have been mapped. Preparation of maps for Southern San Francisco County is in progress. Maps for all of Alameda and San Mateo Counties are scheduled to be completed between 2001 and 2004. The CDMG indicates no current plans for mapping San Joaquin County.

Surface Mining and Reclamation Act

In accordance with the Surface Mining and Reclamation Act of 1975, the state has established a mineral land classification system to help identify and protect mineral resources in areas that are subject to urban expansion or other irreversible land uses that would preclude mineral extraction. Protected mineral resources include construction materials, industrial and chemical mineral materials, metallic and rare minerals, and nonfluid mineral fuels. To identify areas with known mineral resources, the California Mineral Land Classification System has been used to map many areas of the state. This system provides designations for Areas of Identified Mineral Resource Significance, Areas of Undetermined Mineral Resource Significance, Areas of Unknown Mineral Resource Significance, and Areas of No Mineral Resource Significance.

1.5 PROJECT SITES EXISTING CONDITIONS

Tesla Portal Facility

The Tesla Portal site is located on the eastern flank of the Diablo Range on the eastern boundary of the Coast Ranges geomorphic province. The hillside is characterized by alluvial fan deposits sloping gently to the northeast. The Tesla Portal site represents the eastern end of the Coast Range Tunnel, located at the point where the slope begins to rise more steeply to the southwest. The Tesla Portal site is not covered by the state Mineral Land Classification System.

Prior to construction of the existing facilities at this site, tunnel waste was placed over the alluvial fan deposits to form a level pad for the residence and some of the ancillary buildings. A boring drilled in the location of the planned chlorine facilities encountered 10 feet of fill composed of dense silty sand and medium-stiff sandy clay. These materials were underlain by fan materials consisting of cemented, medium-dense silty clay and gravelly sand. The depth to groundwater could not be determined with the drilling method used to complete this boring, although the depth to groundwater at this site is expected to be greater than 20 feet (SFWT, 1999).

The Tesla Portal site is not within an Alquist-Priolo Earthquake Fault Zone. The trace of the San Joaquin thrust fault is near the base of the slope, to the east of the Tesla Portal site. The fault dips about 30 to 35 degrees to the west. The controlling seismic event that could affect the facility would be a characteristic earthquake with a moment magnitude of 6.8 on the San Joaquin fault. An earthquake of this magnitude is estimated to generate a mean peak horizontal bedrock acceleration of 0.37g.[4] A mean peak horizontal velocity of 20 centimeters per second (cm/sec) is recommended for design (SFWT, 1999).

San Antonio Pump Station Site

The San Antonio Pump Station (about 295 feet above mean sea level) is located within the Sunol Valley, just west of Calaveras Road on a flat-lying terrace about 200 yards east of Alameda Creek. A boring completed in the vicinity of the proposed chemical-handling facilities encountered 5 feet of fill composed of medium-stiff silty clay. This fill was underlain by alluvial materials consisting of dense sandy gravel to a depth of 18 feet, where shale bedrock was encountered. A second boring encountered 3 feet of dense sandy gravel underlain by stiff silty clay to a depth of about 8.5 feet; this was in turn underlain by very dense silt sand to a depth of about 16 feet, where sandstone/shale bedrock was encountered (SFWT, 1999). The depth to groundwater could not be determined with the drilling method used, although the depth to groundwater at this site is estimated to be no greater than 15 feet.

The San Antonio Pump Station is within the Sunol Valley, which is mainly designated as Mineral Resource Zone 2 (MRZ-2), Area of Identified Mineral Resource Significance. Mission Valley Rock Company and RMC Lonestar are extracting aggregate near the site. However, the alignment of the Hetch Hetchy Aqueduct and electric utilities that cross the valley are exempt from the MRZ-2 classification.

The Calaveras fault is inferred within the project site and is therefore the most significant source of ground shaking and possibly surface rupture. Because of the proximity of the fault, an Alquist-Priolo Earthquake Fault Zone has been designated for the area encompassing the San Antonio Pump Station (Hart and Bryant, 1999). Trenching completed in 1999 to investigate the location of the fault found no evidence of the fault within 50 feet of the area planned for construction, although the active fault trace is inferred between the planned location of the chemical storage facilities and the existing pump station (SFWT, 2000).

The controlling seismic event that could affect the site would be a characteristic earthquake with a moment magnitude of 6.8 on the Calaveras fault. According to the geotechnical report for the proposed project, horizontal displacement during an earthquake of this magnitude may be on the order of 25 feet, across a 20- to 25-foot-wide zone of deformation. Vertical displacement would be expected to be negligible. An earthquake of this magnitude is estimated to generate a mean

4 Acceleration is scaled against a value that everyone is familiar with, that is, acceleration due to gravity or the acceleration with which a ball falls if released at rest in a vacuum (1.0g). Acceleration of 1.0g is equivalent to a car traveling 100 meters (328 feet) from rest in 4.5 seconds. Acceleration is expressed by "g" which is gravity = 980 centimeters per second squared.

peak horizontal bedrock acceleration of 0.50g. A mean peak horizontal velocity of 45 cm/sec is recommended for design (SFWT, 1999).

Alameda East Portal Site

The Alameda East Portal site (about 350 feet above mean sea level) is located on the east side of Sunol Valley. The facilities at this site are built on a level pad on ground that slopes steeply to the west toward the valley bottom. A geotechnical investigation has not been conducted at this site, although fill materials are expected to be present beneath the existing facility. The site is located within the Sunol Valley, which is mainly designated as MRZ-2, Area of Identified Mineral Resource Significance. The Alameda East Portal site is approximately 200 feet to the east of the Calaveras fault within an Alquist-Priolo Earthquake Fault Zone (Hart and Bryant, 1999).

Alameda West Portal Site

The Alameda West Portal site (about 340 feet above mean sea level) is located on the west side of Sunol Valley. The facilities at this site are on an engineered fill pad built on top of native ground that slopes gently to the east toward Alameda Creek. West of the portal, the hills rise steeply about 300 feet. The Alameda West Portal site is within the Sunol Valley, which is mainly designated as MRZ-2, Area of Identified Mineral Resource Significance.

One boring drilled at this site encountered 6 feet of fill composed of dense sand gravel and medium-dense gravel. The fill is underlain by alluvial deposits consisting of stiff to very stiff sandy clay to at least 21.5 feet (the depth explored). Bedrock at this site is expected to be less than 50 feet below ground surface (SFWT, 1999). The depth to groundwater could not be determined with the drilling method used.

The Alameda West Portal site is not within an Alquist-Priolo Earthquake Fault Zone. This site is approximately 2,800 feet to the west of the Calaveras fault. The controlling seismic event that could affect the site would be a characteristic earthquake with a moment magnitude of 6.8 on the Calaveras fault. An earthquake of this magnitude is estimated to generate a mean peak horizontal bedrock acceleration of 0.50g. A mean peak horizontal velocity of 45 cm/sec is recommended for design (SFWT, 1999).

Some published maps show the Sinbad fault on the west side of Sunol Valley, at the base of the slope on which the Alameda West Portal site is located. Other geotechnical investigations, including trenching at Pirate Creek and in other local areas, in support of construction activities at the Sunol Valley WTP, indicate that there is no active surface trace of the Sinbad fault (AGS, 1999).

Pulgas Site

The Pulgas site is located within the Crystal Springs Valley at the eastern edge of the Santa Cruz Mountains at an elevation of 300 feet. Three borings completed as part of the geotechnical investigation encountered 30.5 to 38 feet of sands, sandy clays, clayey sands, and sandy silt that

are stiff and medium-dense to very dense. The bedrock encountered beneath these materials at alternative sites 1 and 2 (see Section III, Figure III-17) consisted of sandstone. The bedrock encountered beneath these materials at the preferred project site consisted of weathered sandstone and shale (SFWT, 1999). The depth to groundwater at this site was not established as part of the geotechnical investigation. The Pulgas site is not covered by the state Mineral Land Classification System.

The Pulgas site is located within an Alquist-Priolo Earthquake Fault Zone (Hart and Bryant, 1999). The main trace of the San Andreas fault is approximately 2,200 feet to the southwest of the site, but a branch of the fault, the Cañada fault, has been recognized 900 feet away from the site in the same direction. This segment of the San Andreas fault is considered to have an earthquake fault zone with a maximum width of about 3,500 feet. During the 1906 earthquake, ground surface rupture occurred beneath the adjacent Crystal Springs Reservoir (Lawson, 1908; Pampeyan, 1983). During that event, branching and secondary faults were reported near Crystal Springs Dam. Reports indicate that "…cracks emerged from the lake and fan northward up on the hills for several hundreds of yards, breaking fences where they cross" (Lawson, 1908). Interpretation of aerial photographs of the fields surrounding the Pulgas site provide no evidence for surface faulting (SFWT, 1999).

The controlling seismic event that could affect the site would be a characteristic earthquake with a moment magnitude of 7.9 on the San Andreas fault. An earthquake of this size would generate a mean peak horizontal bedrock acceleration of 0.63 g at the Pulgas site. A mean peak horizontal velocity of 100 cm/sec is recommended for design (SFWT, 1999).

Pulgas Balancing Reservoir Site

The Pulgas Balancing Reservoir site is located within the Crystal Springs Valley at the eastern edge of the Santa Cruz Mountains at an elevation of 340 feet. A geotechnical investigation has not been completed at this site. The Pulgas Balancing Reservoir site is not covered by the state Mineral Land Classification System and is not located within an Alquist-Priolo Earthquake Fault Zone.

Harry W. Tracy Water Treatment Plant Site

The Harry W. Tracy WTP site, at an elevation of about 500 feet, is located on a ridge adjacent to the San Andreas Valley. The original topography and surface features were extensively modified by cut-and-fill operations during construction of the water treatment plant in 1969. A geotechnical investigation was conducted at this site in 1990 in support of construction of the ozonation plant, a reservoir, and new pipelines (AGS, 1990). On the basis of this investigation, the surficial materials beneath the northwestern portion of the site consist of fill materials underlain by the Merced formation. The Franciscan assemblage outcrops along the southeastern edge of the site. Groundwater elevations vary widely across the site; the 1990 geotechnical report recommended design groundwater elevations ranging from 368 feet above mean sea level to 460 feet above mean sea level. The Harry W. Tracy WTP site is classified as MRZ-3, Area of Undetermined Mineral Resource Significance.

The site is located within an Alquist-Priolo Earthquake Fault Zone. The San Andreas fault is approximately 600 feet to the southwest of the site. This segment of the San Andreas fault is considered to have an earthquake fault zone with a maximum width of about 1,500 feet. The contact between the Merced formation and the Franciscan assemblage beneath the site may be the result of historic faulting associated with an extension of the Serra fault. The geotechnical report stated there is no compelling evidence that the Serra fault is active (AGS, 1990).

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for geology and seismicity impacts, but it generally considers that implementation of the proposed project would have a significant geologic or seismic impact if it were to:

- expose people or property to geologic hazards, such as earthquakes, landslides, mudslides, ground failure, or similar hazards;
- cause substantial flooding, erosion, or siltation;
- substantially change topography or ground surface relief features; or
- substantially modify any unique geological or physical features.

2.2 IMPACTS

The proposed project includes construction of water treatment facilities at seven locations within a seismically active region. In this section, potential geologic and seismic impacts related to construction of these project components are addressed in accordance with guidelines published by the California Division of Mines and Geology (1982). Based on these guidelines, this EIR evaluated two categories of geologic impacts: seismic hazards and other geologic hazards. Seismic hazards that are considered include ground rupture, ground shaking, liquefaction, landsliding, tsunamis and seiches,[5] differential compaction / seismic settlement, and flooding due to failure of dams and levees. Other geologic hazards that are considered include loss of mineral resources, unstable cut-and-fill slopes, trench wall instability, landslides and mudflows, land subsidence, volcanic hazards, and changes in topography or modifications to unique geologic or physical features. Only those hazards that are considered present at a minimum of one of the project sites are discussed.

The evaluation of these impacts is based on a review of Alquist-Priolo Earthquake Zone Fault maps, Seismic Hazard Mapping Zone maps, county general plans, the geotechnical report prepared for the proposed project, which covers the Tesla Portal, San Antonio Pump Station, Alameda West Portal, and Pulgas sites (SFWT, 1999), and a previous geotechnical report

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5 A tsunami is a series of sea waves instantaneously generated by an earthquake. This hazard is most prevalent at shoreline areas. A seiche is an earthquake-induced wave on an enclosed body of water. This hazard is most prevalent near lakes and reservoirs.

prepared for the Harry W. Tracy WTP. Project-specific geotechnical investigations have not been conducted at the Alameda East, Harry W. Tracy WTP, or Pulgas Balancing Reservoir sites. During the design phase of the proposed project, site-specific geotechnical investigations would be conducted as necessary at Alameda East Portal and Harry W. Tracy WTP, in addition to any follow-up studies at the other sites. At the Pulgas Balancing Reservoir, the proposed reservoir upgrades would consist of construction of interior piping only, and the potential seismic and geotechnical hazards related to such construction are considered minimal; for this reason, a site-specific geotechnical investigation is not required.

Table IV.H-2 provides a summary of the potential seismic and other geologic impacts at each of the project sites and their respective levels of significance.

TABLE IV.H-2
SUMMARY OF IMPACTS – GEOLOGY AND SEISMICITY

		Sunol Valley Sites			Pulgas Sites		
Impact	**Tesla Portal Site**	**San Antonio Pump Station Site**	**Alameda East Portal Site**	**Alameda West Portal Site**	**Pulgas Site**	**Pulgas Balancing Reservoir Site**	**Harry W. Tracy WTP Site**
Seismic hazard – ground rupture	PSM	SM	PSM	PSM	PSM	LS	LS
Seismic hazard – ground shaking	PSM	SM	SM	SM	SM	SM	SM
Seismic hazard – liquefaction	LS	LS	LS	LS	LS	LS	LS
Seismic hazard – landslides	LS	LS	LS	LS	LS	LS	LS
Loss of mineral resources	N/A	LS	LS	LS	N/A	N/A	LS
Unstable cut-and-fill slopes	PSM	N/A	N/A	N/A	N/A	N/A	PSM

SM = Significant Impact, can be Mitigated
LS = Less than Significant Impact
PSM = Potentially Significant Impact, can be Mitigated
SU = Significant Unavoidable Impact
B = Beneficial
N/A = Not Applicable

Seismic Hazards

Movement along a fault can occur gradually as fault creep or more suddenly, resulting in an earthquake. Earthquakes often cause surface ground rupture and related seismic hazards, including ground shaking, liquefaction, and landsliding. The potential for these seismically

induced ground failures is related to the soil, bedrock, and groundwater conditions at each site. Where these failures occur near buildings or other facilities, there is potential for injury to persons and significant economic loss due to structural damage.

Other potential seismic hazards that were evaluated but considered to be absent from each of the proposed project sites include tsunamis and seiches, differential compaction / seismic settlement, and flooding due to failure of dams and levees. The Pulgas site is located 16 feet above the spillway elevation of the Upper Crystal Springs Reservoir, and the potential for a seiche is considered minimal because of this elevation difference.

Ground Rupture

Ground rupture most commonly occurs along preexisting faults, which are zones of weakness, and can occur slowly as fault creep or more suddenly as earthquakes. Fault creep is the slow rupture of the earth's crust along a fault. The rate of movement along a fault can range from approximately 0.1 to 25 millimeters per year. This movement can displace the ground surface and structures such as buildings, roads, or fences built over the trace of the fault. This gradual movement can cause structural damage, but generally does not cause injury to people.

Sudden movement resulting in an earthquake is more damaging than fault creep because it is accompanied by ground shaking. Where rupture occurs near buildings or other facilities, there is a potential for injury to persons and significant economic loss due to structural damage. However, it is impractical from an economic, engineering, and architectural viewpoint to design a structure that can withstand serious damage under the stress of a ground surface rupture.

The Alquist-Priolo Earthquake Fault Zone Act prohibits construction of a structure for human occupancy within 50 feet of the trace of a known active fault. For SFPUC project sites located within an earthquake fault zone, the act would require a geologic investigation to demonstrate that buildings proposed for human occupancy would not be constructed across active faults. If an active fault were identified, any structure for human occupancy would need to be set back at least 50 feet from the trace of the fault. Fault investigations have been conducted for the San Antonio Pump Station and Harry W. Tracy sites, but not for the Alameda East Portal, Alameda West Portal and Pulgas sites, which are also located within an Alquist-Priolo Earthquake Fault Zone.

The SFPUC would be required to comply with the requirements of this act as they pertain to the specific project sites. Although facilities are not proposed for human occupancy per se, SFPUC employees would be present at the sites on a part-time or full-time basis, depending on the site. Compliance with the act would ensure that impacts associated with exposure of people to seismic ground rupture hazards are less than significant.

Tesla Portal. Although ground rupture would not be expected as a result of an earthquake on the San Joaquin thrust fault, the geotechnical report for the proposed project states that extensive ground deformation could occur during a seismic event on the fault. Ground deformation during a maximum-magnitude event on the San Joaquin fault could generate a 1- to 2-foot-high

northwestward-dipping scarp, up to 300 feet wide, possibly accompanied by some extensional fissures (SFWT, 1999). The potential for ground deformation at the Tesla Portal site would be considered a potentially significant impact. On the basis of this scenario, the feasibility of siting the proposed facilities at Tesla Portal would require additional studies to ensure that facilities are not constructed in an area where damage could occur from the formation of a scarp. The mitigation measure described in Section V.H calls for performing more detailed studies, and implementation of this measure would reduce the impact to less than significant.

San Antonio Pump Station Facility. Trenching completed in December 1999 to investigate the location of the Calaveras fault found no evidence of the fault within 50 feet of the footprint of the planned chemical-handling facilities, although the active trace of the Calaveras fault is inferred between the planned chemical-handling facilities and the existing pump station. Due to the proximity of the project site to the inferred location of the active trace of the Calaveras fault, the potential for seismic ground rupture at this site would be considered a significant impact that would require mitigation. Implementation of recommendations from the fault investigation at this site for the siting, design, and construction of the proposed structure would assure that project design and construction would comply with requirements of the Alquist-Priolo Earthquake Fault Zone Act and would ensure that facilities are not constructed within 50 feet of an active fault trace where structural damage could occur. The mitigation measure included in Section V.H would reduce this potential impact to less than significant.

Alameda East Portal. Based on the location of this site within an Alquist-Priolo Earthquake Fault Zone, there is the potential for ground rupture in the event of an earthquake on the Calaveras fault. A fault investigation has not been conducted at this site but would be required in order to construct the proposed permanent dechlorination facility. The potential for seismic ground rupture at this site would be considered a potentially significant impact that would require mitigation. Implementation of recommendations from the site-specific fault investigation and geotechnical studies would reduce the potential seismic ground rupture impact to less than significant and would ensure that facilities are not constructed within 50 feet of an active fault trace where structural damage could occur (see Section V.H of the mitigation measures chapter).

Alameda West Portal. Based on existing data, the ground rupture hazard for the Alameda West Portal site, located about 1/2 mile west of the Calaveras fault, is considered low to moderate (SFWT, 1999). The Sinbad fault, mapped by some on the west side of Sunol Valley, appears to be inactive; however, trenching has not been conducted to support this determination. Therefore, seismic ground rupture would be a potentially significant impact. Although the fault is considered inactive, the geotechnical report prepared in support of construction activities at the Alameda West Portal site recommends trenching to confirm that the fault is inactive (see Section V.H of the mitigation measures chapter). Implementation of recommendations from the fault investigation would reduce the potential seismic ground rupture impact to less than significant and would ensure that facilities are not constructed within 50 feet of an active fault trace where structural damage could occur.

Pulgas Site. Based on the location of this site within an Alquist-Priolo Earthquake Fault Zone, there is the potential for ground rupture in the event of an earthquake on the Cañada fault. A fault investigation has not yet been conducted on this site, but would be required in order to construct the proposed permanent dechloramination facility. The potential for seismic ground rupture at this site would be considered a potentially significant impact that would require mitigation. Implementation of recommendations from the site-specific fault investigation and geotechnical studies would reduce the potential seismic ground rupture impact to less than significant and would ensure that facilities are not constructed within 50 feet of an active fault trace where structural damage could occur (see Section V.H of the mitigation measures chapter).

Harry W. Tracy WTP. Based on the geotechnical investigation conducted at this site in 1990 (AGS, 1990), it was determined that the WTP is located within an Alquist-Priolo Earthquake Fault Zone. However, the evidence suggests that this extension of the San Andreas fault, the Serra fault, is not active. Therefore, the potential for seismic ground rupture would be considered less than significant.

Ground Shaking

As is true for the entire region, it is very likely that high to severe ground shaking during the design lifetime of the proposed development (50 to 100 years) will occur at each of the project sites due to a large earthquake on a nearby active fault. Ground shaking is the most widespread effect of earthquakes and poses a greater seismic threat than local ground rupture. The most likely earthquake sources near the proposed project sites are the San Andreas, Hayward, Calaveras, Greenville, and San Joaquin faults.

The probability of occurrence of major earthquakes on all but the San Joaquin fault is high. The probability of occurrence of a major earthquake on the San Joaquin fault is low to moderate. Such shaking could cause severe damage to or collapse of buildings or other project facilities and could result in significant economic loss to the project and/or endanger the health and welfare of persons. The potential economic loss and endangerment to persons due to the proximity of the site to earthquake sources would be considered a potentially significant impact, unless mitigation were incorporated.

Damage is generally greatest in areas where the soils and surficial units are fine-grained, compressible, and saturated with water. Conversely, damage seems to be least in areas of little or no surficial material or where bedrock is massive, hard, dry, and relatively unfractured or unweathered. Because of the proximity to active faults, the potential for strong ground shaking is considered significant at the San Antonio Pump Station Facility, Alameda East Portal, Alameda West Portal, Pulgas, and Harry W. Tracy WTP sites. At the Tesla Portal, this impact is considered potentially significant because of the lower likelihood of an earthquake on the San Joaquin fault.

Ground cracking, such as that observed during the 1989 Loma Prieta earthquake in the Santa Cruz Mountains, is a secondary effect of ground shaking. It appears as open fissures or cracks in the ground, particularly along the crests of ridges, that open in response to strong shaking. The

exact mechanism that causes earthquake-induced ground cracks is not always clear. However, these fissures can severely damage or destroy a building during an earthquake. Ground cracking is typically a problem only on narrow crested, steep-sided ridges. No topography that would promote ground cracks exists at any of the proposed project sites.

To mitigate the significant hazard of ground shaking, facilities constructed at each site would require a site-specific geotechnical investigation to determine the appropriate seismic design criteria on the basis of soil type, the magnitude of the controlling seismic event, slip rate of the nearest fault, and distance to the nearest active fault (see Section V.H of the mitigation measures chapter). In accordance with the Uniform Building Code, the chemical-handling facilities would be classified as "hazardous facilities," and Uniform Building Code requirements appropriate for the design of such facilities would apply. As part of standard design procedures, the SFPUC would comply with the appropriate Uniform Building Code requirements, and all proposed facilities would be designed to withstand the shaking from the largest maximum credible earthquake. Construction in accordance with appropriate seismic design criteria in the Uniform Building Code would reduce the potential ground shaking impact to less than significant at all project sites. Geotechnical investigations have been conducted at the Tesla Portal, San Antonio Pump Station, Alameda West Portal, and Pulgas sites, although supplemental investigations were recommended for the Tesla Portal and Alameda West Portal sites. Project-specific geotechnical investigations would be required for the Alameda East Portal and Harry W. Tracy WTP sites.

Liquefaction

Liquefaction occurs when generally loose, saturated, cohesionless soils compact under the effects of seismic shaking and lose shear strength, causing them to behave like a liquid. Clays, gravels, and dense sands are generally not susceptible to liquefaction. Potential consequences of liquefaction include the loss of bearing capacity, subsidence, differential settlement, and lateral spreading; these can cause serious building foundation failures, and naturally buoyant structures such as underground storage tanks may be raised above ground.

Previous geotechnical studies evaluated the potential for liquefaction at the Tesla Portal, San Antonio Pump Station, Alameda West Portal, Pulgas, and Harry W. Tracy WTP sites. Liquefaction potential was determined to be low at the Tesla Portal, Alameda West Portal, Pulgas, and Harry W. Tracy sites and low to moderate at the San Antonio Pump Station site. The potential for liquefaction at the San Antonio Pump Station site is considered low to moderate because of a lens of medium-dense silty sand identified during the geotechnical investigation; however, given the scarcity of the liquefiable material and the presence of clayey materials overlying this lens, any ground deformation due to liquefaction is expected to be minimal at this site.

For SFPUC sites where a geotechnical investigation is yet to be conducted, the CDMG should be consulted prior to construction to determine if a seismic hazard map has been prepared for the project location. For any sites located within a mapped zone of potential liquefaction, a screening investigation would be required. The screening investigation would be conducted to identify:

- Potentially liquefiable soils and whether these soils are saturated or could become saturated in the future;
- The extent of the liquefiable materials to determine if they are extensive enough to pose significant risks or can easily be mitigated; and
- The in-place (or in-situ) density of the soil.

If the screening investigation identifies a potential liquefaction hazard, then a more quantified analysis would be required. This analysis would entail a site-specific engineering/geologic investigation and geotechnical laboratory testing to evaluate the potential for liquefaction.

Due to the low to moderate potential for liquefaction at all studied sites and the SFPUC standard procedure to comply with recommendations from site-specific geotechnical studies, this impact would be considered less than significant at all sites.

Earthquake-Induced Landslides

Earthquake-induced landslides can occur in a variety of geologic environments, including rock- or soil-covered slopes. The potential for a specific slope to experience landsliding depends on the type of material on the slope, the steepness of the slope, the compaction of the soil, and the water content of the soil.

Previous geotechnical studies evaluated the potential for landslides at the Tesla Portal, San Antonio Pump Station, Alameda West Portal, and Pulgas sites, and the potential for landslides at all studied sites was determined to be low. However, for SFPUC sites where a geotechnical investigation is yet to be conducted, the CDMG should be consulted prior to construction to determine if a seismic hazard map has been prepared for the project location. For any sites located within a mapped zone of potential landslides, a screening investigation would be required. The screening investigation would be conducted to identify:

- Existing or historic landslides on or near the project site;
- Geologic formations or other earth materials on or near the site that are known to be susceptible to landslides;
- Any springs or seeps indicating saturated soil or potential areas where concentrated infiltration of water could occur upslope of the project site;
- Any landslide-susceptible landforms such as steep slopes, colluvium-filled swales, cliffs or banks being undercut by stream or wave action, or areas that have recently slid; and
- Any project components, such as concentrated runoff from impervious surfaces, that could increase the potential for future landsliding.

If the screening investigation identifies a potential landslide hazard, then a more quantified analysis would be required. This analysis would entail a site-specific geologic investigation and a slope stability analysis to determine the potential for landsliding.

Due to the low potential for earthquake-induced landslides at all studied sites and the SFPUC standard procedure to comply with recommendations from site-specific geotechnical studies, this impact would be considered less than significant at all sites.

Other Geologic Impacts

In addition to seismic hazards, potential geologic hazards considered to be present for at least one of the proposed project sites include trench wall instability, loss of mineral resources, and unstable cut-and-fill slopes. These potential impacts are discussed below. Other potential geologic impacts evaluated in this EIR are considered to be absent from all proposed project sites, including landslides and mudflows, land subsidence, volcanic hazards, and changes in topography or modifications to unique geologic or physical features. Impacts related to waste disposal are discussed in Section IV.I, Hazardous Materials, and impacts related to erosion, sedimentation, and flooding are discussed in Section IV.D, Water Quality and Hydrology.

Subgrade excavation would occur at the Pulgas site for installation of pipelines or other site improvements, potentially resulting in trench wall instability. The construction contractor for this site would comply with applicable regulations of the federal Occupational Health and Safety Administration and California Occupational Health and Safety Administration, which would ensure that the impact is less than significant.

Loss of Mineral Resources

Areas of mineral resource significance are identified through the Surface Mining and Reclamation Act of 1975 using the state Mineral Land Classification System. Those areas with significant resources receive a classification of MRZ-2, Area of Identified Mineral Resource Significance. Although three of the proposed project sites (San Antonio Pump Station, Alameda East Portal, and Alameda West Portal) are within an area classified as MRZ-2, the Hetch Hetchy Aqueduct and electric utilities that cross the valley are exempt from the MRZ-2 classification. The Harry W. Tracy WTP site is classified as MRZ-3, Area of Undetermined Mineral Resource Significance. Therefore, impacts due to loss of mineral resources at the San Antonio Pump Station, Alameda East Portal, Alameda West Portal, and Harry W. Tracy WTP sites are considered less than significant. The Tesla Portal and Pulgas sites are not covered under this classification system, so this impact is not applicable at these sites.

Unstable Cut-and-Fill Slopes

Otherwise stable slopes can become unstable during excavation and construction if they are cut too steeply or if the bottom of the slope is undercut. Prior to designing the cut-and-fill slopes for a project, a geotechnical investigation would be conducted to identify the design parameters for the slopes, based on the specific facilities to be constructed and the height of the slopes. The preliminary geotechnical report prepared for the proposed project sites concludes that cut-and-fill slopes at each site investigated could be designed using inclinations of 2:1 (horizontal to vertical).

At the Tesla Portal site, the proposed roadway would be constructed on a hillside, resulting in a potentially unstable cut-and-fill slope. At the Harry W. Tracy WTP site, the proposed ammonia and chlorine feed system would be constructed on a hillside, adjacent to the existing buildings. Substantial excavation would be required to construct the proposed buildings, potentially resulting in an unstable cut-and-fill slope, which would be a potentially significant impact. For these sites, implementation of recommendations from the site-specific geotechnical studies pertaining to cut-and-fill slopes would ensure that impacts are less than significant (see Section V.H).

No cut-and-fill slopes are proposed at the San Antonio Pump Station, Alameda East Portal, Alameda West Portal, and Pulgas sites. Construction at Alameda East Portal and Alameda West Portal would be within the existing pad. Therefore, impacts associated with unstable cut-and-fill slopes are not applicable at these sites.

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I. HAZARDOUS MATERIALS

The Initial Study for this project evaluated the potential public health hazards associated with construction and operation of proposed facilities (see Appendix A). The Initial Study determined that such hazards could result from increased chemical use at all facility locations. Therefore, this section evaluates public health hazards associated with the delivery, use, and storage of hazardous materials, as well as the potential for encountering hazardous materials during project construction and the potential for accidental releases of treatment chemicals. The Initial Study determined that the issue of accidental discharges of chlorinated or chloraminated water would primarily pertain to water quality and aquatic resources. Therefore, this issue is discussed in Section IV.C, Biological Resources, and Section IV.D, Hydrology and Water Quality.

1.0 SETTING

1.1 METHODOLOGY

This assessment focuses on the use of chemicals at each of the proposed project sites; hazardous building materials that may be encountered during construction at each of the sites; and the potential of encountering hazardous substances in soil and groundwater during construction. The analysis is based on information from the following:

- Hazardous materials business plans for each of the proposed project sites that handle hazardous materials;
- Regulatory database searches to identify environmental cases within one mile of each proposed project site (Vista Information Solutions, 1999a,b,c,d); and
- Visual site reconnaissance.[1] (During the reconnaissance, each site was generally surveyed for the presence of hazardous materials; a more detailed site inspection did not appear warranted based on observations.)

1.2 REGULATORY FRAMEWORK

Two key terms are used throughout this section:

> Hazardous Materials. Hazardous materials are substances with certain physical properties that could pose a substantial present or future hazard to human health or the environment when improperly handled, disposed, or otherwise managed. Hazardous materials are grouped into the following four categories based on their properties: toxic (causes human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), and reactive (causes explosions or generates toxic gases).[2] Hazardous materials have been and are commonly used in commercial, agricultural, and industrial applications as well as in residential areas to a limited extent.

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1 Site visit to Tesla Portal and San Antonio Pump Station on September 22, 1999. Site visit to Harry W. Tracy WTP, Pulgas Water Temple, and Pulgas Balancing Reservoir on October 1, 1999.

2 Title 22 of the *California Code of Regulations*, Division 4.5, Chapter 11, Article 3.

Hazardous Waste. A hazardous waste is any hazardous material that is discarded, abandoned, or is to be recycled. The criteria that render a material hazardous also make a waste hazardous (California Health and Safety Code, Section 25151). If improperly handled, hazardous materials and wastes can result in public health hazards if released to the soil or groundwater or through airborne releases in vapors, fumes, or dust.

Federal, state, and local regulations extensively regulate hazardous materials and hazardous wastes, with the major objective of protecting public health and the environment. In general, these regulations provide definitions of hazardous substances; establish reporting requirements; set guidelines for handling, storage, transport, remediation, and disposal of hazardous wastes; and require health and safety provisions for both workers and the public. Regulatory agencies also maintain lists, or databases, of sites that handle hazardous wastes or store hazardous substances in underground storage tanks, as well as of sites where soil or groundwater quality may have been affected by hazardous substances.

The major federal, state, and regional agencies enforcing these regulations include the U.S. Environmental Protection Agency (federal); the Department of Toxic Substances Control and the Regional Water Quality Control Board (state); and the Bay Area Air Quality Management District (regional). Local regulatory agencies enforce many federal and state regulations through the Certified Unified Program Agency. In addition, a number of local agencies at the county and city level have local ordinances regulating the use and storage of hazardous materials. Appendix E provides a more detailed description of the hazardous materials regulatory framework and the regulatory agencies responsible for implementing hazardous materials regulations.

Risk Management Regulations

Businesses that handle specified quantities of chemicals are required to submit a hazardous materials business plan to the appropriate local agency in accordance with community right-to-know laws. The hazardous materials business plan allows local agencies to respond appropriately in the event of a chemical release, fire, or other incident. The plan includes:

- An inventory of hazardous materials with specific quantity data, storage, or containment descriptions, ingredients of mixtures, and physical and health hazard information;
- Site and facility layouts that must be coded to chemical storage areas and other facility safety information;
- Emergency response procedures for a release or threatened release of hazardous materials;
- Procedures for immediate notification of releases to the administering agency;
- Evacuation plans and procedures for the facility;
- Descriptions of training for employees (consistent with their responsibilities) in evacuation and safety procedures to be followed in the event of a release or threatened release of hazardous materials, and proof of implementation of such training on an annual basis; and
- Identification of local emergency medical assistance appropriate for potential hazardous materials incidents.

1.3 POTENTIAL PRESENCE OF HAZARDOUS MATERIALS IN SOIL AND GROUNDWATER

A regulatory database search identified sites with registered underground or aboveground storage tanks, sites permitted to handle hazardous wastes under the Resource Conservation and Recovery Act (RCRA), and environmental cases within a one-mile radius of each site. Appendix E presents the name and date of each database reviewed. Environmental cases identified on the regulatory lists represent only those sites suspected of being contaminated or that have had hazardous materials investigations stemming from site disturbance activities, such as removal of an underground storage tank, a spill of hazardous substances, or excavation for construction. Sites with documented soil contamination would not be likely to affect a proposed project site unless the contamination extended onto the project site; thus, only adjacent sites with soil contamination would have the potential to affect soil quality at a site. However, groundwater plumes may migrate over long distances. In general, groundwater contamination within a one-half-mile radius would have the greatest likelihood of affecting groundwater quality at a project site.

Sites permitted to handle hazardous wastes under RCRA and sites with registered underground or aboveground storage tanks are known and approved to handle hazardous substances. The presence of these substances does not necessarily indicate that contamination of a site has occurred, just that the substances are present. Because the use of these substances is well regulated, the potential for site contamination at permitted sites is generally low. Underground and aboveground storage tanks and permitted RCRA facilities were identified only if they were located adjacent to a proposed project site.

1.4 HAZARDOUS BUILDING MATERIALS

Some building materials commonly used in older buildings could present a public health risk if disturbed during an accident or during demolition. These materials include asbestos, electrical equipment such as transformers and fluorescent light ballasts that contain polychlorinated biphenyls (PCBs), fluorescent lights containing mercury vapors, and lead-based paints. Asbestos and lead-based paint may also present a health risk to building occupants if the materials are in a deteriorated condition. If removed during demolition of a building, these materials would require special disposal procedures.

Until the 1970s, asbestos was a common building material used for insulation, shingles and siding, roofing felt, floor tiles, brake linings, and acoustical ceiling material (Allegri, 1986). Asbestos is a known carcinogen, and the primary pathway of exposure is through inhalation; if asbestos is present in “friable” (easily crumbled) form, then asbestos fibers can be inhaled. Depending on the condition of the building materials, there is a potential for airborne asbestos fibers to be present in many of the structures in the project area.

PCBs were manufactured in the United States between 1929 and 1977 for such uses as electrical transformers and capacitors and fluorescent light ballasts (Harte, 1991). PCBs are highly toxic, persist in the environment, accumulate in biological systems, interfere with reproduction, and act as

an immunosuppressant. Under the Toxic Substances Control Act of 1978, the manufacture, processing, and commercial distribution or use of any PCB was prohibited, except when contained in a totally enclosed manner. The manufacture of PCBs and the distribution of PCBs in commerce were banned in 1979. However, utilities and other owners of PCB-filled electric transformers and capacitors were allowed to maintain the equipment for its working life, if it did not leak. The USEPA Spill Cleanup Policy dictates that spills of materials containing PCBs at concentrations of 50 parts per million (ppm) or greater be cleaned up within 48 hours. If a transformer has leaked, the oil is tested to determine PCB levels and subsequent cleanup requirements.

New transformers (installed after 1983) contain a nameplate that specifies the PCB content level, which is less than1 ppm. If an individual wants to have a transformer tested, there is a charge for the test, which varies based on the size of the shutdown and the size of the transformer. If the transformer exceeds a PCB concentration of 50 ppm, the fee is refunded (Harte, 1991).

Most fluorescent light ballasts manufactured prior to 1978 contain approximately 0.5 ounces of PCBs in a small capacitor, although the quantity can be up to 2 ounces (USEPA, 1992). In 1978, the USEPA estimated that there were approximately 850 million of these capacitors in use in the United States (Cal-EPA, 1992). Disposal to a landfill of more than 1 pound of PCBs, or approximately 16 capacitors, requires notification of the USEPA under the Comprehensive Environmental Response, Compensation and Liability Act. Ballasts manufactured after January 1, 1978 do not contain PCBs and are labeled as such on the ballast.

Spent fluorescent light tubes commonly contain mercury vapors at levels high enough to be considered a hazardous waste under California law; depending on the levels of mercury present, the light tubes may also be classified as hazardous under federal law (Cal-EPA, 1992).

Lead-based paint was commonly used in buildings constructed prior to 1960. Lead is toxic to humans, particularly young children, and can cause a range of health effects depending on the level of exposure. When adhered to the surface of materials, lead-based paints pose little health risk; however, delaminated or chipping paint can be a threat to the health of young children or other building occupants who ingest the paint. Lead dust resulting from demolition of older structures can also present public health risks. Lead-based paint that has separated from a structure can also contaminate nearby soil.

1.5 EXISTING CONDITIONS AT PROJECT SITES

Tesla Portal Facility

Current Chemical Usage

Water from the Hetch Hetchy system is currently chlorinated at the Tesla Portal with sodium hypochlorite. The water treatment chemicals stored at this site include two 14,000-gallon aboveground tanks of sodium hypochlorite, as summarized in Table IV.I-1. Each of the tanks is double contained, but the fill pipes for each tank are not. In addition, a 1,000-gallon propane

TABLE IV.I-1
SUMMARY OF WATER TREATMENT CHEMICALS CURRENTLY USED AT EACH SITE AND DELIVERY FREQUENCIES

Chemical Feed System	Existing Total Storage	Proposed Total Storage	Bulk Chemical Concentration	Existing Delivery Frequency	Proposed Delivery Frequency
Tesla Portal					
Sodium Hypochlorite	Two – 13,000-gallon tanks	Eight – 13,000-gallon tanks	12.5%	Every 1 to 5 days depending on tunnel flow rate	3 to 5 deliveries per week (average) 8 to 10 deliveries per week (maximum)
San Antonio Pump Station					
Sodium Hypochlorite	None	Five – 11,490-gallon tanks	12.5%	N/A	3 to 4 deliveries per week (average) 6 to 7 deliveries per week (maximum)
Sodium Thiosulfate	5,000 lbs (dry), 1,500 gallons (liquid)	Unchanged	40%	Approximately 2 to 3 times per year	Approximately 4 to 6 times per year for proposed systems at Alameda East and Alameda West
Aqueous Ammonia	None	Four – 6,500-gallon tanks	19%	N/A	1 delivery per week (average) 2 deliveries per week (maximum)
Sodium Hydroxide[a]	None	Three – 10,670-gallon tanks	25%	N/A	2 deliveries per week (average) 7 deliveries per week (maximum)
Alameda East					
Sodium Thiosulfate	1,000 lbs (dry), Two – 200-gallon tanks (liquid)	2,000 lbs (dry), Two – 500-gallon tanks (liquid)	40%	Included in deliveries to San Antonio Pump Station	Continue to transfer as needed from San Antonio Pump Station
Alameda West					
Sodium Thiosulfate	None	2,000 lbs (dry), Two – 500-gallon tanks (liquid)	40%	Included in deliveries to San Antonio Pump Station	Transfer as needed from San Antonio Pump Station
Pulgas Site					
Sodium Hypochlorite	None	Five – 13,130-gallon tanks	12.5%	N/A	1 to 2 deliveries per week (average) 5 to 7 deliveries per week (maximum)
Sulfuric Acid	None	Fourteen – 55-gallon drums	98%	N/A	1 delivery every 1 to 2 weeks

TABLE IV.I-1 (Continued)
SUMMARY OF WATER TREATMENT CHEMICALS CURRENTLY USED AT EACH SITE AND DELIVERY FREQUENCIES

Chemical Feed System	Existing Total Storage	Proposed Total Storage	Bulk Chemical Concentration	Existing Delivery Frequency	Proposed Delivery Frequency
Sodium Thiosulfate	None	Two – 11,490-gallon tanks	35%	N/A	1 delivery every 2 weeks (average) 5 deliveries per week (maximum)
Harry W. Tracy Water Treatment Plant					
Sodium Hypochlorite	Two – 15,000-gallon tanks	Three – 20,000-gallon tanks	12.5%	2 to 3 per week	3 per week
Aqueous Ammonia	None	Two – 2,600-gallon tanks	19%	N/A	1 every 2 weeks (average) 2 per week (maximum)
Sodium Thiosulfate	None	2,000 lbs (dry), Two – 100-gallon tanks (liquid)	36%	None	1 every 6 months
Cationic Polymer	Two – 11,000-gallon tanks	Unchanged	20%	Deliveries 1 per month	Unchanged
Ferric Chloride	Two – 11,000-gallon tanks	Unchanged	43%	1 per month	Unchanged
Alum (not being used)	One – 15,000-gallon tank	Unchanged	48.5%	1 per month (when used)	Unchanged
Fluoride	Two – 4,500-galllon tanks	Unchanged	24%	1 every 2 weeks	Unchanged
Liquid oxygen	One – 18,000-gallon tank One – 6,000-gallon tank	Unchanged	99.5%	1 every 3 months (typical); 1 per week (if running on liquid oxygen)	Unchanged
Caustic	One – 18,000-gallon tank	Unchanged	50%	1 every 5 days	Unchanged
LT20	1 ton (maximum) in 100 lb sacks dry chemical	Unchanged	100%	1 ton pallet per year	Unchanged

a The final location of the caustic facilities has not been determined. The sodium hydroxide may be stored at either the Tesla Portal or the San Antonio Pump Station.
N/A = Not applicable

SOURCE: Barbara Palacios, Water Quality Engineering, SFPUC, 1999 and 2000.

tank, compressed-gas cylinders of carbon dioxide, and sodium thiosulfate are stored at the site. Small quantities of paint thinner, oils, lubricants, isopropanol, transmission fluid, and antifreeze are also used for maintenance activities at the Tesla Portal (SFPUC, 1997a).

Potential Presence of Hazardous Substances in Soil and Groundwater

The Tesla Portal site is located in a rural area and is not identified as a potential hazardous waste site or a RCRA-permitted facility. No environmental cases were identified within a one-mile radius of the site. The planned expansion area is fenced and landscaped, and visual observation during a site visit did not indicate the presence of hazardous materials.

Two water wells were identified, 0.22 mile west and 0.87 mile northeast of the site. The first well is 396 feet deep, at a surface elevation of 351 feet above sea level, and is unused; the second well, drilled in 1950, is 782 feet deep, at a surface elevation of 242 feet above sea level, and is used for irrigation purposes.

Hazardous Building Materials

Most of the structures at the Tesla Portal facility were constructed prior to 1960; on this basis, hazardous building materials could be present within the structures. However, the structure proposed to be demolished was likely constructed between 1963 and 1967. To date, there have been no surveys conducted to identify hazardous materials in buildings at this site.

San Antonio Pump Station Site

Current Chemical Usage

With the exception of a small quantity of sodium thiosulfate used to dechlorinate water that is pumped to San Antonio Creek or San Antonio Reservoir, water treatment chemicals for Hetch Hetchy water are not currently handled at the San Antonio Pump Station. The chemicals or petroleum products used at this facility are required for operation of the pump station. These include:

- One 400-gallon waste oil tank contained in a below-ground vault;
- One 550-gallon lubrication oil tank without secondary containment;
- Two 9,000-gallon aboveground diesel tanks within secondary containment; and
- Petroleum spirits and solvents used for cleaning valves, pumps, and engines.

In addition, there are cylinders of carbon dioxide at the facility and a flammable-materials storage shed for waste oil, lubricants, and other oils and greases (SFPUC, 1997b). Diesel fuel and lubricant oil are stored within the pump building, and drummed wastes are stored for pickup in a small shelter in the southwest corner of the facility. Wastes typically stored under this shelter include spent oil filters and spent cans of spray paint. During a site visit on September 22, 1999, spent mercury from the retrofitting of flow meters was stored in this area for pickup by a waste hauler.

A chemical storage facility located to the north of the San Antonio Pump Station stores sodium hypochlorite, which is used for chlorine trimming. Sodium thiosulfate, used for dechlorination of system overflows and discharges to San Antonio Reservoir and Creek, is also stored in this facility. These chemicals are stored inside of the building, and the fill pipes are located outside of the building. There is no secondary containment for the fill pipes.

Potential Presence of Hazardous Substances in Soil and Groundwater

The San Antonio Pump Station site is not identified as a potential hazardous waste site or a RCRA-permitted facility. No environmental cases were identified within a one-mile radius of the site. Visual observation during a site visit did not indicate the presence of hazardous materials in the area planned for construction.

Alameda East Portal Site

Current Chemical Usage

To protect water quality in Alameda Creek, the Alameda East Portal has a temporary dechlorination system that uses sodium thiosulfate to dechlorinate emergency discharges. The trailer stationed at Alameda East Portal serves as a portable dechlorination facility. Approximately 1,000 pounds of dry sodium thiosulfate are kept at Alameda East Portal. In addition, there are two 200-gallon tanks with a 40 percent solution of prepared sodium thiosulfate. All chemical deliveries are sent directly to the San Antonio Pump Station. SFPUC personnel deliver the sodium thiosulfate to Alameda East Portal as needed.

Potential Presence of Hazardous Substances in Soil and Groundwater

The Alameda East Portal site is in a rural area and is not identified as a potential hazardous waste site or a RCRA-permitted facility. No environmental cases were identified within a one-mile radius of the site. Visual observation during a site visit did not indicate the presence of hazardous materials in the area planned for construction.

Alameda West Portal Site

Current Chemical Usage

No hazardous materials or petroleum products are currently used or stored at the Alameda West Portal.

Potential Presence of Hazardous Substances in Soil and Groundwater

The Alameda West Portal site is in a rural area and is not identified as a potential hazardous waste site or a RCRA-permitted facility. No environmental cases were identified within a one-mile radius of the site. Visual observation during a site visit did not indicate the presence of hazardous materials in the area planned for construction.

Pulgas Site

Current Chemical Usage

No hazardous materials or petroleum products are currently used or stored at the Pulgas site. However, dechlorination chemicals would be used for the proposed Pulgas Dechlorination Facility, to be located at a site located about 300 feet southwest of the Pulgas Water Temple (see Section VI.B.1.0, Related Projects and Plans). Sulfuric acid or carbon dioxide may also be used for temporary pH control at this location.

Potential Presence of Hazardous Substances in Soil and Groundwater

The Pulgas site is in a rural area and is not identified as a potential hazardous waste site or a RCRA-permitted facility. No environmental cases were identified within a one-mile radius of the site. Visual observation during a site visit did not indicate the presence of hazardous materials in the area planned for construction.

Pulgas Balancing Reservoir Site

Current Chemical Usage

No hazardous materials or petroleum products are currently used or stored at the Pulgas Balancing Reservoir.

Potential Presence of Hazardous Substances in Soil and Groundwater

The Pulgas Balancing Reservoir site is in a rural area and is not identified as a potential hazardous waste site or a RCRA-permitted facility. No environmental cases were identified within a one-mile radius of the site. Visual observation during a site visit did not indicate the presence of hazardous materials in the area planned for construction.

Harry W. Tracy Water Treatment Plant

Current Chemical Usage

The Harry W. Tracy WTP provides a treatment system for raw water from the Peninsula Watershed. The chemicals used in the treatment process are summarized in Table IV.I-1. Storage facilities have separate containment for the fluoride and sodium hypochlorite and secondary containment for all of the water treatment chemicals. In accordance with the requirements of the San Mateo County Environmental Health Division, the hazardous materials business plan includes a Spill Prevention Plan specifying how hazardous materials used at the site are handled to prevent a spill or release; where a release is most likely to occur; and the best management practices to be followed to prevent a release of hazardous materials to the storm sewer system. Oils, paints, solvents, laboratory chemicals, fuels, carbon dioxide, and other chemicals are also used at the site in support of the water treatment process (SFPUC, 1999).

Potential Presence of Hazardous Substances in Soil and Groundwater

The regulatory database search described in Section 1.3 identified a report of a leak of motor vehicle fuel from an underground storage tank at the Harry W. Tracy WTP (referred to as the San Andreas Filter Plant) on June 23, 1993. The case was reported to affect soil only and was closed on April 13, 1995 after excavation and disposal of the contaminated soil. The Harry W. Tracy WTP site is not identified as a RCRA-permitted facility. Visual observation during a site visit did not indicate the presence of hazardous materials in the area planned for construction.

The database search identified the following case within a one-mile radius of the site:

- At a distance of 0.09 mile northwest of the site, there is a report of a leak of gasoline from an underground storage tank at the Shell station located at 3999 Skyline Boulevard in San Bruno. The leak was reported on September 3, 1985, and a site assessment began on October 15, 1992. The database search indicated that the preliminary site assessment is still underway and that groundwater was affected by the leak. The date of the last review by San Mateo County is April 6, 1998.

1.6 SFPUC EMERGENCY RESPONSE PROCEDURES

The hazardous materials business plans for the facilities that store chemicals specify response procedures to be implemented in the event of a chemical emergency, in accordance with the applicable local regulations. These procedures include the following:

- A fire, spill, release, or threatened release of hazardous materials or hazardous waste would be immediately reported to the emergency coordinator. If emergency assistance is required, the initial observer or emergency coordinator would call 911.

- The emergency coordinator would notify appropriate SFPUC personnel or regulatory agencies and/or initiate site-specific response plans or procedures, as appropriate.

- During a chemical emergency, employees would be notified vocally (by shouting), by phone, by alarms, or by a public address system, depending on the size of the facility. At the San Antonio Pump Station, personnel would also contact the on-duty operator or standby chief at the Sunol Valley WTP and Sunol maintenance yard. Neighbors who may be affected would be notified by phone or in person.

- In the event of a fire, 911 would be called immediately. Equipment would be shut down, if safe to do so, and trained personnel would use fire extinguishers to suppress the fire. Absorbent barriers would be placed around the site to limit the spread of hazardous materials from the fire, if the fire is small and the situation permits. If possible, water treatment would continue during the emergency, or the equipment would be placed back in service as soon as possible.

- Should the emergency coordinator determine that evacuation is required, personnel would exit to the assembly area specified in the emergency response plan, and the highest ranking SFPUC operations staff member at the site would do a head count to make certain that all personnel are safely away from the site.

- Concurrent with notification, trained personnel or outside contractors would begin cleanup and/or containment of the spill or release as soon as it is safe to do so.
- Minor injuries may be treated on-site by personnel trained in first aid. In the event that an employee experiences a serious chemical exposure, illness, or injury, 911 would be called and the victim would be transported to the nearest hospital or treated as determined by the paramedics responding to the call.
- In the event of an earthquake, chemical handling facilities that could be most easily damaged would be inspected or isolated immediately following the earthquake.

Plant personnel maintain a comprehensive inventory of emergency response equipment at the facility. Emergency response equipment is regularly inspected and maintained. In accordance with community right-to-know laws, a copy of the hazardous materials business plan is on file with the local fire department to assist them in responding to chemical emergencies at the SFPUC chemical storage facilities.

1.7 SFPUC EMPLOYEE TRAINING

SFPUC is developing a comprehensive policies and procedures training program for treatment and operations personnel. Under this program, policy and procedure manuals are being developed, and employees will be trained in all facets of water treatment operations. The program has four main components, including:

- Water treatment fundamentals;
- SFPUC system operations;
- Environmental compliance; and
- Health and safety compliance (including hazard communication and emergency response).

All operations staff receive training in these four general areas as well as in topics specific to the facility where they work, such as chlorination and disinfection; chemical storage, feed, and handling; unit processes; monitoring stations; pumping stations; and balancing reservoirs. Until the comprehensive program is developed, employees are trained using existing documentation, such as the emergency response plans, operations plans, and hazardous materials business plans prepared for each facility.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not formally adopted significance standards for hazardous materials impacts, but it generally considers that implementation of the proposed project would have a significant effect if it were to:

- involve a substantial risk of accidental explosion or release of hazardous substances (including, but not limited to, oil, pesticides, chemicals, or radiation);

- expose people to existing sources of potential hazards, including hazardous materials;
- create a public health hazard or potential public health hazard; or
- interfere with an emergency response plan or emergency evacuation plan.

Threshold levels of hazardous materials and wastes are provided in Title 40 of the *Code of Federal Regulations* and in Title 22 of the *California Code of Regulations*. Determination of what constitutes a "substantial" hazard or "insignificant" level of hazardous materials is made by the regulatory agencies on a case-by-case basis, depending on the proposed uses, potential exposure, and degree and type of hazard.

2.2 IMPACTS

This section assesses potential impacts related to hazardous materials at each of the proposed project sites. These impacts include accidental releases of stored chemicals; the presence of hazardous substances in soil that would be excavated; the release of chemicals during construction; and the presence of hazardous building materials. A summary of impacts that apply to each site is provided in Table IV.I-2.

TABLE IV.I-2
SUMMARY OF IMPACTS – HAZARDOUS MATERIALS

		Sunol Valley Sites			Pulgas Sites		
Impact	**Tesla Portal Site**	**San Antonio Pump Station Site**	**Alameda East Portal Site**	**Alameda West Portal Site**	**Pulgas Site**	**Pulgas Balancing Reservoir Site**	**Harry W. Tracy WTP Site**
Accidental release of stored chemicals	LS	LS	LS	LS	LS	N/A	LS
Chemicals in soil	LS	LS	LS	LS	LS	LS	PSM
Release of chemicals from construction equipment	LS	LS	LS	LS	LS	LS	LS
Hazardous building materials	LS	N/A	N/A	N/A	N/A	N/A	N/A

SM = Significant Impact, can be Mitigated
LS = Less than Significant Impact
PSM = Potentially Significant Impact, can be Mitigated
SU = Significant Unavoidable Impact
B = Beneficial
N/A = Not Applicable

Impacts related to increases in the transport of water treatment chemicals are not further discussed because the transport of chemicals is well regulated by the Department of Transportation and county hazardous waste management plans. These plans contain policies regarding transport of hazardous materials and wastes, including handling and packaging requirements as well as procedures for emergency response. Impacts related to the release of chemicals during chemical feedline replacement are also not considered, because it is proposed that new chemical feedlines be installed at all sites rather than replaced.

Accidental Release of Stored Chemicals

Construction of the proposed project would introduce chemical storage or increase chemical storage at each of the project sites, except at the Pulgas Balancing Reservoir. Sodium hypochlorite would be delivered to the Pulgas Balancing Reservoir site in a chemical feedline and would be stored at the proposed dechloramination facility on the opposite side of Cañada Road. The existing and proposed chemical storage volumes for all sites are summarized in Table IV.I-1.

The primary hazardous materials concern related to the proposed storage facilities and feedlines is the spillage of liquid chemicals. Other related concerns include increased potential for spills associated with the increased volume of chemicals at all sites, the mixing of incompatible chemicals, and the potential for a gaseous release in the event of an accidental spill. These concerns are discussed separately below.

Chemical spillage can occur during normal operations, either due to equipment malfunction or operator error, or to geologic hazards such as ground shaking. However, the proposed project includes design provisions for secondary containment for both chemical storage tanks and feed pipelines, in accordance with applicable regulations (see Chapter III, Figure III.6). The loading area would be designed either to have its own secondary containment or to drain to the tank containment area. These measures would provide containment in the event that a chemical spill occurred during transfer or storage. Chemical loading would occur within a covered area to prevent rain from draining into the containment sump. Any chemical spillage into the secondary containment areas would be pumped and disposed of, depending on the chemical, in accordance with any applicable regulations. At the Tesla Portal and Alameda East Portal sites, the existing chemical loading and storage areas do not include secondary containment. Therefore, the proposed project would upgrade these chemical loading and storage areas. In addition, the chemical handling systems for all sites would be designed to withstand any identified geologic hazards (e.g., ground shaking and slope instability) (see Section IV.H, Geology and Seismicity). These design provisions would minimize any risk associated with the release of chemicals at all sites.

The proposed project would increase chemical storage at the Tesla Portal, Alameda East Portal, San Antonio Pump Station, and Harry W. Tracy WTP sites and would introduce chemical storage at the Alameda West Portal and Pulgas sites. Generally, an increase in chemical volume can result in a commensurate increase in the potential for spills. However, as described above, the proposed improvements would reduce risks associated with the potential for spills at Tesla

Portal and Alameda East Portal sites compared to the existing conditions. At the other sites, the project is designed to minimize any risk associated with release of chemicals. In addition, the SFPUC has emergency response procedures in place as part of its hazardous materials business plans. As required by law, new hazardous materials business plans would be prepared for those project components that currently do not store chemicals, and existing hazardous materials business plans would be updated to reflect the hazardous substances used as part of the proposed project. Provisions included in the plans would minimize the risks associated with storage or accidental spills of chemicals.

Mixing of incompatible chemicals could potentially occur at the San Antonio Pump Station and the Harry W. Tracy WTP sites, where both sodium hypochlorite and ammonia would be stored. Although unlikely, if these chemicals were mixed as a result of an accidental release, an exothermic reaction would occur.[3] This reaction could result in the production of heat, thereby increasing the volatilization rate of toxic vapors such as chlorine, hydrochloric acid, or ammonia. However, as shown in Chapter III, Figure III-9, these two chemicals would be stored in different rooms, separated by a wall, and would have separate chemical containment. At the Harry W. Tracy WTP, these two chemicals would be stored in different buildings, or in different rooms with separate chemical containment if only one building were built, as required by applicable regulations. These design provisions would minimize any risk or public health hazard associated with the mixing of incompatible chemicals.

Ammonia can have a sufficient vapor pressure to cause a gaseous release in the event of an accidental spill. However, if this were to occur, the amount of ammonia vapor released to the air would depend upon the concentration of ammonia in solution stored on site. The concentration of ammonia in the solution to be stored at the proposed facilities (only the San Antonio Pump Station and Harry W. Tracy WTP sites) would be less than 20 percent. This concentration could release only small amounts of ammonia vapor, which would be a less than significant impact.

As described above, compliance with hazardous materials regulations would provide a high level of public health protection. The impact associated with accidental releases would be less than significant at each of the proposed project sites, and no additional mitigation beyond existing hazardous materials regulations is recommended.

Chemicals in Soil

Construction at each of the proposed project sites would involve excavation for the construction of storage and feed facilities, chemical feedlines, and an underground contactor basin and recirculation pipeline at the Pulgas site. Based on visual observations and a regulatory database search, the potential to encounter hazardous materials in the soil is low at all sites, although an underground storage tank site was removed from the Harry W. Tracy WTP. However, if petroleum hydrocarbons were identified in the location of the previous underground storage tank, or previously unidentified hazardous substances were identified during construction of the proposed project, exposure of workers and the public to hazardous substances could occur

3 An exothermic reaction is one that produces heat.

through inhalation of vapors, fumes, or contaminated dust; dermal contact with contaminated substances; or direct or indirect ingestion of such substances. The degree of public health impact would depend on the nature and extent of any petroleum hydrocarbons or hazardous substances encountered.

Prior to construction of the proposed project at the Harry W. Tracy WTP, the location of the former underground storage tank would be identified and, if construction would occur at the location of the former tank, available data would be reviewed to identify the concentrations of petroleum hydrocarbons remaining in the soil. In addition, standard SFPUC construction procedures include provisions for addressing previously unidentified hazardous substances. If evidence of hazardous materials were discovered during excavation, sampling would be necessary to identify the substances present, and the appropriate regulatory agencies would be notified. Contractors would be trained to recognize visible evidence of hazardous substances, including soil discoloration, suspicious odors, or the presence of underground tanks, piping, or other buried building materials. The contractor would have a contingency plan for sampling and analysis of potentially hazardous substances, and for coordination with the regulatory agencies.

If hazardous substances or petroleum hydrocarbons were identified, the contractor would be required to prepare site health and safety plans, sampling and investigation plans, and, if necessary, disposal or remediation plans. Remediation could be required, depending on the type and extent of the substances, and a health and safety plan would be prepared to reduce the potential for exposure of workers and the public to hazardous substances during construction. Any site investigations or remediations would be performed in accordance with applicable laws. Typically, the county environmental health agency (identified in Appendix E) would be the responsible agency; the San Francisco Bay Regional Water Quality Control Board could be involved if the groundwater or surface water were contaminated, and the California Department of Toxic Substances Control could become involved if soils were contaminated.

The potential to encounter petroleum hydrocarbons in the location of the previous underground storage tank at the Harry W. Tracy WTP is a potentially significant impact, although it would be mitigated through the implementation of standard soil management procedures (see Section V.I of the mitigation measures chapter). Assuming implementation of standard construction procedures and requirements, the potential to encounter previously unidentified chemicals in soil would not result in exposure of people to chemical hazards. This impact would be less than significant at all sites.

Release of Chemicals from Construction Equipment

During construction of the proposed project at the Sunol Valley sites and the Pulgas site, construction equipment could accidentally release petroleum products such as oil, grease, or fuel, which could in turn enter an adjacent waterway and degrade water quality. Where construction activities are adjacent to a waterway, the construction contractor(s) would be required to prepare a spill prevention, control, and countermeasure plan and enforce strict on-site handling rules to keep construction and maintenance materials out of receiving waters. The plan would include measures to be taken in the event of a spill (see Section IV.D, Hydrology and Water Quality).

Assuming compliance with existing regulations, impacts associated with the potential release of chemicals from construction equipment would be less than significant.

Hazardous Building Materials

Construction at the Tesla Portal site would require demolition of the outbuilding next to the garage at the watershed-keeper's residence. If friable or nonfriable asbestos were present, asbestos fibers could be released from disturbance of asbestos-containing materials. Such a release could expose the public and construction workers to airborne asbestos fibers. Similarly, if lead-based paint were present and had delaminated or chipped from the surfaces of the building materials, lead particles could be released into the air. If PCBs were present in the building to be demolished, leakage could expose workers to unacceptable levels of PCBs (greater than 5 ppm, based on Title 22, *California Code of Regulations*). If fluorescent light tubes were broken during removal, workers could be exposed to mercury vapors. Proposed construction at all other project sites would not involve the demolition of buildings or disturbance of hazardous building materials. Therefore, this impact is not applicable at the San Antonio Pump Station, Alameda East Portal, Alameda West Portal, Pulgas, Pulgas Balancing Reservoir, and Harry W. Tracy WTP sites.

SFPUC standard construction procedures include provisions for addressing disposal and handling of hazardous building materials, as required by applicable laws. The SFPUC would ensure that a hazardous building materials survey were completed for the outbuilding at the Tesla Portal site by a registered environmental assessor or a registered engineer prior to commencement of construction or demolition activities. If any friable asbestos-containing materials or lead-containing materials were identified, adequate abatement procedures, such as containment and/or removal, would be implemented prior to demolition. PCB-containing equipment or fluorescent lights containing mercury vapors would be removed and disposed of properly. Assuming implementation of standard construction procedures, the potential to encounter hazardous building materials would not result in exposure of people to chemical hazards. This impact would be less than significant at the Tesla Portal site.

REFERENCES – Hazardous Materials

California Environmental Protection Agency (Cal-EPA), Department of Toxic Substances Control, *Lighting Wastes*, 1992.

● Harte, John; Holdren, Cheryl; Schneider, Richard; and Shirley, Christine, *Toxics A to Z, A Guide to Everyday Pollution Hazards*, University of California Press, 1991.

San Francisco Public Utilities Commission (SFPUC), Tesla Portal Hypochlorite Station, *Hazardous Materials Business Plan*, 1997a.

San Francisco Public Utilities Commission, San Antonio Pump Station, *Hazardous Materials Business Plan*, 1997b.

San Francisco Public Utilities Commission, Harry W. Tracy Water Treatment Plant, *Hazardous Materials Business Plan*, 1999.

U.S. Environmental Protection Agency (USEPA), Note to Hank Habicht regarding Disposal of PCB-Containing Fluorescent Light Ballasts, 1992.

Vista Information Solutions, Site Assessment Plus Report, Tesla Portal, 1999a.

Vista Information Solutions, Site Assessment Plus Report, San Antonio Pump Station, 1999b.

Vista Information Solutions, Site Assessment Plus Report, Pulgas Water Temple, 1999c.

Vista Information Solutions, Site Assessment Plus Report, Harry W. Tracy WTP, 1999d.

J. TRANSPORTATION

The Initial Study for the proposed project evaluated potential traffic impacts associated with construction and operation of project-related facilities (see Appendix A). Such impacts were determined to be less than significant at all facility locations, except the Pulgas site. Therefore, this EIR does not include further discussion of construction-related and operational traffic increases at the Tesla Portal, San Antonio Pump Station, Alameda East Portal, Alameda West Portal, and Harry W. Tracy WTP sites.

Although operational traffic increases were determined to be less than significant at the Pulgas site in the Initial Study, construction-related traffic increases were identified as a concern. Additionally, more detailed information on the proposed project has become available since completion of the Initial Study and has warranted further discussion of operational traffic at the Pulgas site. This section provides a more detailed impact assessment of potential construction-related impacts and a supplemental discussion of operational traffic safety impacts at the Pulgas site.

1.0 SETTING

1.1 PULGAS SITE

Roadway Network

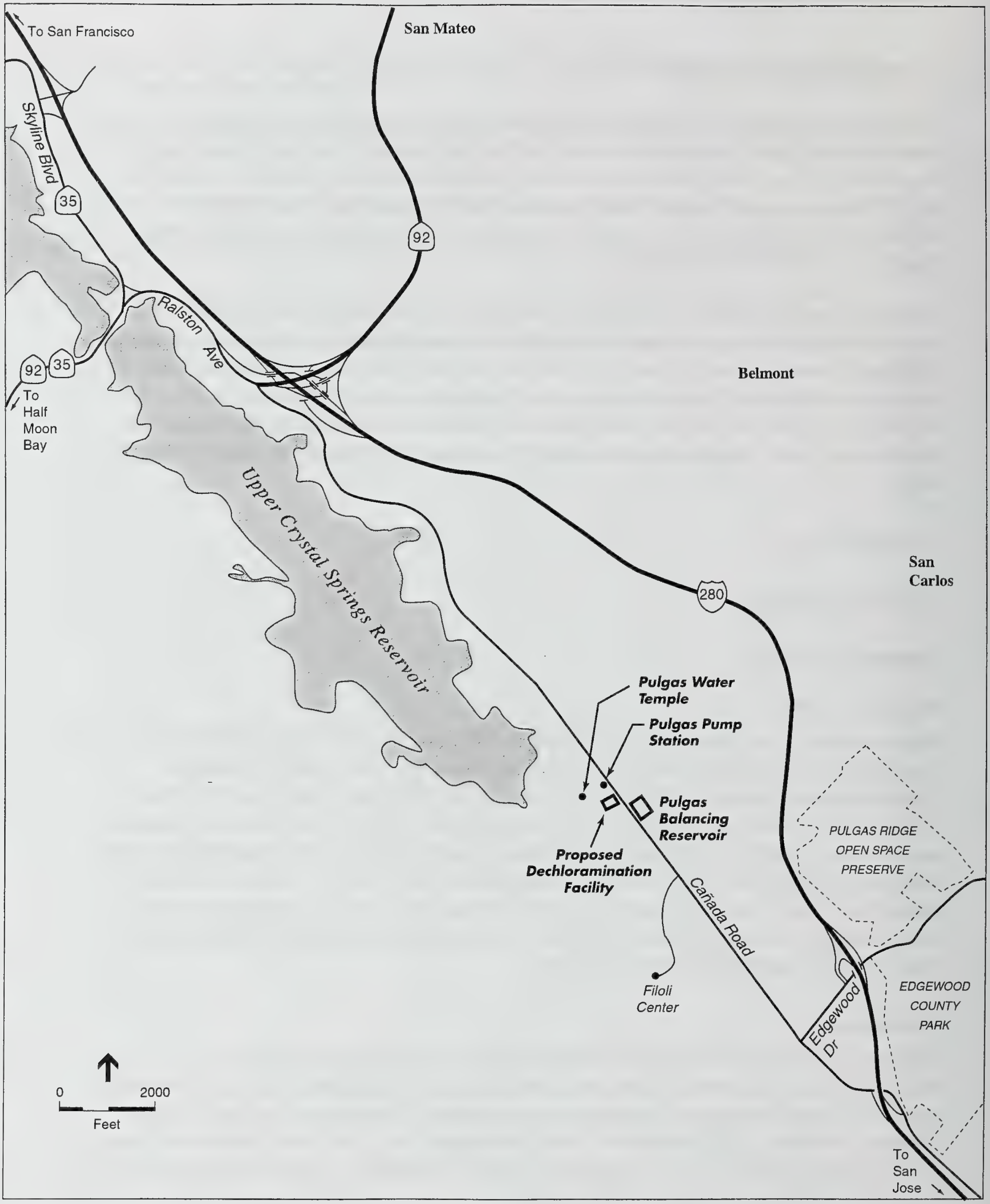
Regional Access

Regional access to the project site is provided by I-280, State Route (SR) 92, and SR 35 (see Figure IV.J-1). I-280 is a major north-south freeway in the Bay Area, extending along the Peninsula between downtown San Francisco and San Jose. SR 92 serves as a major east-west route, connecting the city of Half Moon Bay to the west and the city of San Mateo and points east across the Bay. SR 92 is a two-lane regional arterial west of Cañada Road (along Ralston Avenue and Half Moon Bay Road), and a freeway east of Cañada Road. SR 35 is a north-south regional arterial that extends along the Peninsula ridgeline between San Francisco and northern Santa Clara County. In the project vicinity, SR 35 has two lanes and extends west via Half Moon Bay Road, and north via Skyline Boulevard to I-280.

Local Access

The project site is located off Cañada Road in unincorporated San Mateo County (see Figure IV.J-1). Access to/from I-280 north of the project site is available via Skyline Boulevard / Ralston Avenue / Cañada Road (two-lane regional arterials). Access directly to/from SR 92 to the north is available via Cañada Road. South of the project site, I-280 access is made via Cañada Road and Edgewood Road (two-lane regional arterial). Additionally, access directly onto I-280 south of the project site is made via Cañada Road.

A description of the roadway characteristics of Cañada Road, Edgewood Road, Ralston Avenue, and Skyline Boulevard in the project vicinity is presented in Table IV.J-1.



SOURCE: ESA+Orion, 2000

1998.898E: Hetch Hetchy Water Treatment Project-Chloramine Conversion / 990095

Figure IV.J-1
Pulgas Site Roadway Network

TABLE IV.J-1
ROADWAY CHARACTERISTICS ON LOCAL ROADWAYS IN THE VICINITY OF THE PULGAS SITE

Roadway	**SR 35 (Skyline Boulevard)**	**SR 92 (Ralston Avenue)**	**Cañada Road**			**Edgewood Road**
Segment	**Between I-280 and Ralston Avenue**	**Between Skyline Boulevard and Cañada Road**	**Between SR 92 and Pulgas Water Temple**	**Between Pulgas Water Temple and Edgewood Road**	**Between Edgewood Road and I-280**	**Between Cañada Road and I-280**
Roadway Class[a]	Regional Arterial	Regional Arterial	Regional Arterial	Regional Arterial	Regional Arterial	Regional Arterial
Number of Lanes	2	2/4	2	2	2	2
Lane Width	11.5' - 12'	12'	11.5' - 12'	11.5' - 12'	11.5' - 12'	11.5' - 12'
Posted Maximum Speed Limit	40 mph	45 mph	50 mph	50 mph	50 mph	40 mph
Alignment	Descends and winds from I-280 to reservoir; 30 mph recommended speed limit on curves	35 mph recommended speed limit on one curve	Gently rolling and winding; 45 mph recommended speed limit on curves	Mostly level; straight	Mostly level; gradual horizontal curve at I-280	Level; straight
Physical Condition	Good	Good	Good	Good	Good	Good
Intersection Control	Signal at SR 92; stop signs on I-280 off-ramps and on Bunker Hill Drive approach to SR 35	Signals at SR 35 and Cañada Road	Signal at SR 92	Pulgas Water Temple exit contains stop sign at Cañada Road	--	Stop sign at Cañada Road; stop signs on I-280 off-ramps
Bicycle Facilities	Paved shoulder with varying width, but no designated bikeway	Paved shoulder with varying width, but no designated bikeway	Class II bikeway (signed and striped); 4' – 6' width	Class II bikeway (signed and striped); 4' – 6' width	Class II bikeway (signed and striped); 4' – 6' width	Paved shoulder with 4' width, but no designated bikeway

TABLE IV.J-1 (Continued)
ROADWAY CHARACTERISTICS ON LOCAL ROADWAYS IN THE VICINITY OF THE PULGAS SITE

Roadway	**SR 35 (Skyline Boulevard)**	**SR 92 (Ralston Avenue)**	**Cañada Road**			**Edgewood Road**
Segment	**Between I-280 and Ralston Avenue**	**Between Skyline Boulevard and Cañada Road**	**Between SR 92 and Pulgas Water Temple**	**Between Pulgas Water Temple and Edgewood Road**	**Between Edgewood Road and I-280**	**Between Cañada Road and I-280**
Pedestrian/ Equestrian Facilities	--	--	Signed and striped pedestrian/equestrian crossing approximately 0.6 mile north of Pulgas Water Temple	Signed and striped pedestrian/equestrian crossing at Edgewood Road	--	--
Parking	Small, unpaved lot near SR 92	--	Prohibited except at turnouts	Prohibited except at turnouts	Prohibited except at turnouts	Small, unpaved lot near Cañada Road; Park and Ride lot near I-280
Notes	"Signal Ahead" sign with flashing light on southbound SR 35 approach to SR 92		Northbound left-turn lanes on Cañada Road into the Filoli Estate and the Pulgas Water Temple entrances, and at SR 92; southbound left-turn lanes on Cañada Road at Edgewood Road 35 mph recommended speed limit on Cañada Road near Pulgas Water Temple and Filoli Estate entrances Southbound merge lane on Cañada Road south of SR 92; northbound merge lane on Cañada Road north of Edgewood Road "Signal Ahead" flashing sign on northbound Cañada Road approach to SR 92 Crystal Springs Trail (hiking and equestrian trail) follows along the west side of Cañada Road			"Cross Traffic Do Not Stop" sign posted at intersection Trail connecting to Edgewood County Park follows along the south side of Edgewood Road

a Roadway classification as defined in the *San Mateo Countywide Transportation Plan*.

SOURCE: Environmental Science Associates, 2000

Bicycle/Pedestrian/Equestrian Network

A description of bicycle/pedestrian/equestrian facilities along study area roadways is presented in Table IV.J-1. As identified in the table, Cañada Road is well-served by bicycle and pedestrian/equestrian facilities, including Class II bikeways, and the Crystal Springs pedestrian/equestrian trail.[1]

The San Mateo County Parks and Recreation Department, as part of its "Bike Sunday" program, closes the section of Cañada Road between Ralston Avenue and Edgewood Road every Sunday to vehicular traffic. This program operates year-round, every Sunday, 9 a.m. to 4 p.m. (except in inclement weather and during winter holidays). See Section IV.B, Land Use and Recreation, for a detailed discussion of the Bike Sunday program.

Traffic Volumes

Daily traffic volumes on roadways in the project vicinity are presented in Table IV.J-2. Weekday a.m. peak-period traffic patterns are characterized predominantly by commuter traffic traveling east on SR 92 and south on I-280, with reverse directional patterns during the p.m. peak period. Cañada Road is used by recreational vehicular traffic throughout the week, and includes visitors to the Pulgas Water Temple and the Filoli Estate. The Pulgas Water Temple operates Monday through Friday, 9 a.m. to 4 p.m., and is closed on weekends; the Filoli Estate is open Tuesday through Saturday, from mid-February to October 31.

Truck traffic on SR 35 (along Skyline Boulevard north of Ralston Avenue) accounts for about 8 percent of total traffic on that highway. Truck traffic on SR 92 west of Ralston Avenue accounts for about 5 percent of total traffic on that highway (Caltrans, 1999a).

Traffic Safety

Data from accident reports maintained by San Mateo County were compiled for Cañada Road (between SR 92 and I-280) and Edgewood Road (between Edgewood Road and I-280) for the three-year period from 1996 through 1998 (the most recent data available). Traffic accident rates in terms of the number of accidents per million vehicle-miles traveled (MVMT) for the primary roadways providing access to the project site are presented in Table IV.J-3. The rates have been examined to determine if these roads exhibit any unusual safety problems or accident statistics.

There were 23 reported accidents between 1996 and 1998 on the study roadway segments, 9 of which occurred at the intersection of Cañada Road / Edgewood Road. The principal contributing factors cited in the cause of the accidents included: failure to yield (39 percent), improper turns (26 percent), and unsafe speed (22 percent). Of the total reported accidents on study area segments, 10 (43 percent) involved vehicles overturning or hitting a fixed object or animal; 7 (30 percent) involved vehicle-vehicle collisions; 5 (22 percent) involved vehicle-bicycle

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[1] Class II bikeways are bike lanes striped within the paved areas of roadways and established for the preferential use of bicycles.

TABLE IV.J-2
DAILY TRAFFIC VOLUMES ON ROADWAYS IN THE PULGAS STUDY AREA

Roadway	Location	Daily Traffic (Vehicles Per Day)
Interstate 280	North of SR 92	96,000
	South of Edgewood Road	91,000
State Route 92	East of I-280	77,000
State Route 92 (Ralston Avenue)	Between I-280 and Skyline Boulevard	21,400
State Routes 92/35 (Half Moon Bay Road)	West of Skyline Boulevard	24,400
State Route 35 (Skyline Boulevard)	North of Ralston Avenue	5,300
Cañada Road	Between SR 92 and Edgewood Road	2,200
	Between Edgewood Road and I-280	3,390
Edgewood Road	West of I-280	3,180
	East of I-280	20,330

SOURCES: Caltrans, 1999a; San Mateo County Public Works Department, 1999 daily counts

TABLE IV.J-3
REPORTED ROADWAY ACCIDENTS ON ROADWAYS IN PULGAS PROJECT VICINITY[a]

Roadway	Reported Accidents/ MVMT[b]			Average Rate	Expected Rate (Statewide
	1996	1997	1998	1996-1998	Average)
Cañada Road					
Between SR 92 and Edgewood	1.14	1.42	1.42	1.33[c]	1.22
Between Edgewood and I-280	0.00	0.00	0.00	0.00[c]	1.22
Edgewood Road					
Between Cañada and I-280	0.00	2.97	2.97	1.98[c]	1.22

a Estimated and expected accident rates on Cañada and Edgewood Roads based on information contained in the Statewide Integrated Traffic Report System, as summarized by the San Mateo County Public Works Department; and *1998 Accident Data on California State Highways*, Caltrans, 1999b.
b MVMT = million vehicle-miles traveled
c The accident rates for these roadway segments exclude the accidents that occurred at the intersection of Cañada Road / Edgewood Road during the three-year study period. Available data indicate the accident rate per million vehicles for this intersection is higher than the statewide average for typical rural intersections.

SOURCES: Environmental Science Associates, San Mateo County Public Works Department, Caltrans, 2000

collisions; and 1 involved a collision between bicycles. The majority of accidents occurred in the midday to late-afternoon period, and approximately one-third of the total accidents occurred after daylight hours. No reported accidents involved trucks.

As shown in Table IV.J-3, Cañada Road (between SR 92 and Edgewood Road) and Edgewood Road (between I-280 and Cañada Road) exhibited an average three-year accident rate (1.33 and 1.98 accidents per MVMT, respectively) that was higher than the statewide average for roadways of this type (1.22 accidents per MVMT), while Cañada Road between I-280 and Edgewood Road experienced no accidents. The accident rates for these segments exclude accidents that occurred at the intersection of Cañada and Edgewood Roads during the three-year study period. Available data indicate the accident rate per million vehicles for this intersection is higher than the statewide average for typical rural intersections.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

Traffic Circulation

The City has not formally adopted significance standards for traffic circulation impacts, but it generally considers that implementation of the proposed project would have a significant effect on traffic circulation if it were to:

- cause an increase in traffic that is substantial in relation to existing traffic load and capacity of the street system (as defined by local government plans and policies); or
- interfere with the existing transportation network, causing substantial alterations to circulation patterns or major traffic hazards.

Pedestrian and Bicycle Safety

The City has not formally adopted significance standards for impacts related to pedestrian and bicycle safety, but it generally considers that implementation of the proposed project would have a significant effect on pedestrian or bicycle safety if it were to:

- result in a substantial hazard to pedestrians or bicyclists; or
- substantially constrain or discourage access to the project area.

2.2 IMPACTS

Summary of Impacts By Project Component

Table IV.J-4 provides a summary of the transportation impacts associated with specific components of the proposed project.

TABLE IV.J-4
SUMMARY OF IMPACTS – TRANSPORTATION

		Sunol Valley Sites			Pulgas Sites			
Impact	Tesla Portal Site	San Antonio Pump Station Site	Alameda East Portal Site	Alameda West Portal Site	Pulgas Site	Pulgas Balancing Reservoir Site	Harry W. Tracy WTP Site	Secondary Discharge Locations
Vehicle trip generation	N/A	N/A	N/A	N/A	LS	N/A	N/A	N/A
Traffic safety impacts from construction and operational traffic	N/A	N/A	N/A	N/A	LS	N/A	N/A	N/A

SM = Significant Impact, can be Mitigated
LS = Less than Significant Impact
PSM = Potentially Significant Impact, can be Mitigated
SU = Significant Unavoidable Impact
B = Beneficial
N/A = Not Applicable

Vehicle Trip Generation – Pulgas Site

Proposed construction at the Pulgas site would result in short-term increases in the number of vehicle trips on roadways serving the project site. Construction-generated traffic would be temporary and therefore would not result in a significant, long-term degradation in operating conditions or level of service at project roadways. The primary off-site impact would be a short-term and intermittent lessening of roadway capacities due to the slower movements and larger turning radii of trucks compared to passenger vehicles.

During the approximate one-year construction schedule, off-site construction traffic would include trucks delivering equipment and materials (including concrete, pipe, engineered fill) to the work sites, trucks hauling excavated materials from the site, and the daily arrival and departure of construction workers. Proposed construction hours would be 7:00 a.m. to 5:00 p.m., Monday through Friday. Based on the construction scenario and activities assumptions presented in Table III-2, construction at this location would generate an average of approximately 22 off-site truck round-trips per day (44 one-way trips) and, under peak construction conditions, would generate approximately 64 off-site truck round-trips per day (128 one-way trips). Up to 42 off-site worker vehicle round-trips (84 one-way trips) would be generated during the peak construction phase. Construction traffic would access the Pulgas site through the Pulgas Water Temple entrance. The facility driveway would provide construction access to the Pulgas Balancing Reservoir across Cañada Road. It is assumed trucks and construction workers would

use a combination of Cañada Road and Edgewood Road, and/or Skyline Boulevard to access SR 92 and/or I-280.

The presence of construction traffic would be most noticeable on Cañada Road and Edgewood Road. During peak construction conditions, the temporary increase in daily vehicular trips due to the movement of equipment, materials, and workers to and from the project site would account for up to a 10 percent increase in daily traffic volumes on Cañada Road between SR 92 and I-280, and up to a 7 percent increase in daily traffic volumes on Edgewood Road between I-280 and Cañada Road. Given the overall low level of traffic on these roadways, project traffic would not significantly reduce capacity or affect traffic flow on these arterials. The temporary increase in construction trips would account for a 2 percent increase over existing volumes on SR 35 (Skyline Boulevard) and less than 1/2 percent above existing volumes on SR 92 and I-280. This increase in daily vehicle trips would fall within the daily fluctuations of traffic and therefore would not significantly disrupt traffic flow on these freeways and arterials. Project-related hauling and deliveries would be dispersed throughout the day, thus lessening the effect on peak-hour traffic. Therefore, since the increase in traffic due to construction activities would not disrupt the existing traffic load or capacity of the street system, this impact would be less than significant.

As discussed under the heading "Vehicle Trip Generation," above, operation of the proposed project would generate 2 to 5 chemical deliveries per week under average flow conditions, and 12 to 14 deliveries under maximum flows (which occur three to four months out of the year, typically during summer months). Such delivery rates would generate an average of one off-site truck round-trip per day (two one-way trips) under average flow conditions, and up to three off-site truck round-trips per day (six one-way trips) under maximum flows. Operation of the project would also require additional staffing of one staff person. Such small increases in traffic relative to background traffic volumes on project area roadways would be considered less than significant.

Traffic Safety Impacts From Construction and Operation – Pulgas Site

The temporary construction traffic, including large trucks, would interact with other motor vehicles, bicyclists, pedestrians, and/or equestrians along study area roadways and inside the Pulgas Water Temple access and parking lot, creating the potential for conflicts among these travel modes. As indicated in Section 1.0, Setting, above, Cañada Road and Edgewood Road currently experience higher accident rates than the statewide average for roadways of their type. However, the proposed construction access points are not situated where unusually high numbers of accidents have occurred.

Cañada and Edgewood Roads in the project vicinity are well-designed for accommodating multiple travel modes. As discussed in Section 1.0, Setting, Class II bike lanes are located along both sides of Cañada Road. The Crystal Springs Trail, which follows alongside Cañada Road, provides physical separation from the roadway for pedestrian and equestrian travel. Striped and signed pedestrian/equestrian crossings exist at Edgewood Road and at a trail crossing approximately 600 feet north of the Pulgas Water Temple entrance. Although Edgewood Road is

not a designated Class II bikeway, it contains 4-foot paved shoulders for bike travel, and a trail alongside the roadway provides physical separation for pedestrian and equestrian travel between Cañada Road and Edgewood County Park (located east of I-280).

Construction would not occur on weekends, when overall vehicular, bicycle, and pedestrian activities are at their greatest along Cañada Road and Edgewood Road. The proposed weekday-only construction schedule would avoid any conflicts with the Bike Sunday program on Cañada Road.

Construction at the Pulgas site, including new pipeline installation, could temporarily limit or prevent public access to the temple during construction. The proposed diversion pipeline and chemical pipelines would traverse the overflow parking lot as well as the temple grounds. The overflow parking lot would not be accessible during most of the 14-month construction period. As discussed in Section IV.B, Land Use and Recreation, the attractiveness of the water temple for weddings and other events could be diminished during the construction period; however, as part of the proposed project, the SFPUC would not issue special permits for weddings or other events during the construction period. Pedestrian and bicycle use of Cañada Road and the temple area could be constrained at certain times on weekdays if construction were to block access or discourage use of the area.

Because construction activities would not substantially constrain or discourage pedestrian or bicycle access to the project area and because these effects would be temporary, construction impacts would be considered less than significant. However, improvement measures to reduce construction disruption are recommended. The measures include a traffic control plan to ensure safety for vehicular, pedestrian, and bicycle circulation and signage to alert users of the site of the construction schedule, as described in Section V.N of the mitigation measures chapter.

As discussed in the Initial Study, operation of the proposed project would generate a small number of chemical deliveries to the Pulgas site. However, the SFPUC would schedule chemical deliveries to occur on Monday through Saturday only (except in emergency situations), thereby avoiding potential conflicts with the Bike Sunday program. Improvement measures described in Section V.N to coordinate with San Mateo County for potential emergency chemical deliveries that occur on Sundays would further reduce potential conflicts with recreational traffic.

REFERENCES – Transportation

California Department of Transportation (Caltrans), *1997 Annual Average Daily Truck Traffic on the California State Highway System*, 1998.

California Department of Transportation (Caltrans), *1998 Traffic Volumes on California State Highways*, 1999a.

California Department of Transportation (Caltrans), *1998 Accident Data on California State Highways*, 1999b.

K. NOISE

The Initial Study for this project evaluated the potential direct noise impacts associated with construction and operation of project-related facilities (see Appendix A). In addition, the Initial Study assessed the indirect noise impacts of truck and vehicular traffic generated by construction and operation of these facilities. Potential direct and indirect noise increases associated with construction and operation of proposed facilities were determined to be less than significant at all facility locations except the Pulgas site. Therefore, the EIR does not include discussion of construction-related and operational noise increases at the Tesla Portal, San Antonio Pump Station, and Harry W. Tracy WTP sites. This section provides a more detailed assessment of potential noise impacts at the Pulgas site.

1.0 SETTING

1.1 PULGAS SITE

Existing Noise Environment

The noise environment of the proposed dechloramination facility site and Pulgas Balancing Reservoir is relatively quiet due to the undeveloped nature of the area. Primary noise sources in the project vicinity include Cañada Road immediately to the east and I-280 approximately 1/2 mile to the east. Water flowing through the Pulgas Water Temple is also a minor source of noise, which is generated when water flows from the Hetch Hetchy Aqueduct through the temple into Crystal Springs Reservoir.

The *San Mateo County General Plan* (1986) includes a Community Noise Map, which indicates that noise levels were projected to exceed 60 dBA (CNEL)[1] by 1995 within 1,000 to 2,000 feet of the I-280 freeway. Since I-280 is the primary source of noise in this area, ambient noise levels are likely less than 60 dBA (CNEL) in the Pulgas Water Temple vicinity.

Noise Regulations

The following noise regulations would apply to any new development within San Mateo County. However, these requirements would not apply to the proposed project, because cities and counties are not subject to the requirements of other cities and counties (pursuant to California Government Code 53090, et seq.).

San Mateo County Noise Ordinance

The *San Mateo County Noise Ordinance* (Chapter 4.88) specifies exterior noise standards for uses adjacent to residences, schools, hospitals, churches, or public libraries. These standards, listed in Table IV.K-1, are applicable to nontransportation-related noise sources and establish maximum

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[1] CNEL, Community Noise Equivalent Level, represents a cumulative measure in decibels (dBA) of community noise during a 24-hour period. It applies weighting factors to account for people's lower tolerance to noise during the evening (7 p.m. to 10 p.m.) and night (10 p.m. to 7 a.m.).

TABLE IV.K-1
SAN MATEO COUNTY NOISE STANDARDS[a]

Cumulative number of minutes in any one-hour time period	Maximum Allowable Noise Level in dBA: Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
30 (L_{50})	55 (L_{50})	50 (L_{50})
15 (L_{25})	60 (L_{25})	55 (L_{25})
5 ($L_{8.3}$)	65 ($L_{8.3}$)	60 ($L_{8.3}$)
1 ($L_{1.7}$)	70 ($L_{1.7}$)	65 ($L_{1.7}$)
0 (L_{max})	75 (L_{max})	70 (L_{max})

[a] L_{50} = the noise level that is exceeded 50 percent of a given time period, which is 30 minutes of a 60-minute time period; L_{25} = the noise level that is exceeded 25 percent of a given time period, which is 15 minutes of a 60-minute time period; $L_{8.3}$ = the noise level that is exceeded 8.3 percent of a given time period, which is 5 minutes of a 60-minute time period; $L_{1.7}$ = the noise level that is exceeded 1.7 percent of a given time period, which is 1 minute of a 60-minute time period; and L_{max} = maximum instantaneous noise level.

SOURCE: *San Mateo County Noise Ordinance*, 1997

average exterior noise levels to which the specified noise-sensitive land use types may be exposed.

The following activities are exempted from noise ordinance standards:

- Activities conducted in parks, public playgrounds, and school grounds, provided such parks, playgrounds, and school grounds are owned and operated by a public entity.
- Noise sources associated with demolition, construction, repair, remodeling, or grading of any real property, provided these activities do not take place between the hours of 6:00 p.m. and 7:00 a.m. on weekdays, 5:00 p.m. and 9:00 a.m. on Saturdays, or at any time on Sundays, Thanksgiving, and Christmas.

San Mateo County General Plan

The "Man-Made Hazards" section of the *San Mateo County General Plan* (County of San Mateo, 1986) addresses noise impacts of transportation facilities within the County. This section identifies residential areas of high noise exposure and institutional noise exposure, referencing the state exterior noise exposure of 70 dBA (CNEL) or greater as unacceptable for residential uses. This section of the general plan identifies areas with noise exposures in excess of 70 dBA (CNEL), but none are within the project vicinity. Noise levels at institutional uses (schools, libraries, hospitals, and convalescent homes) within the County are also listed in this section of the general plan. All but a few of these uses were exposed to noise levels between 50 and

60 dBA (Leq),[2] which is normally considered acceptable for such uses. Institutional uses where noise exposure was found to be higher are not located within the project vicinity.

Sensitive Receptors

The "Man-Made Hazards" section of the County's general plan defines noise-sensitive land uses as "land uses most sensitive to noise intrusion, including, but not limited to, residential and the following institutional uses: hospitals, schools and libraries." Although recreational uses are not specifically identified as noise-sensitive, the Pulgas Water Temple could be considered noise-sensitive, given the nature of its use for special events (e.g., weddings). The Filoli Estate, a 654-acre private landholding approximately 4,200 feet (0.8 mile) south of the site, could also be considered noise-sensitive, given the nature of its uses. The Filoli Estate, which is open to the public, includes one historic residence, gardens, and nature trails.

No other noise-sensitive receptors are present within the vicinities of the proposed dechloramination facility site or the Pulgas Balancing Reservoir site. The closest residential uses are over one mile to the east of the facility and east of I-280.

2.0 IMPACTS

2.1 SIGNIFICANCE CRITERIA

The City has not adopted significance standards for noise impacts, but it generally considers that the proposed project would have a significant noise impact if it were to substantially increase the ambient noise levels for adjoining areas.

Proposed facilities at the Pulgas site would be located within San Mateo County; however, the proposed project would not be subject to local the noise ordinance requirements, because cities and counties are not subject to the requirements of other cities and counties (pursuant to California Government Code 53090, et seq.). Although compliance is not required, ordinance requirements can be used as a guideline under CEQA for determining the significance of a noise increase. Therefore, applicable *San Mateo County Noise Ordinance* standards were used to evaluate project-related operational and construction-related noise increases.

2.2 IMPACTS

Summary of Impacts By Project Component

Table IV.K-2 provides a summary of the noise impacts associated with specific components of the proposed project.

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2 Leq: Equivalent energy noise level, which is the average acoustic energy content of time-varying noise during the measurement period.

TABLE IV.K-2
SUMMARY OF IMPACTS – NOISE

Impact	Tesla Portal Site	Sunol Valley Sites: San Antonio Pump Station Site	Sunol Valley Sites: Alameda East Portal Site	Sunol Valley Sites: Alameda West Portal Site	Pulgas Sites: Pulgas Site	Pulgas Sites: Pulgas Balancing Reservoir Site	Harry W. Tracy WTP Site	Secondary Discharge Locations
Construction noise impacts	LS	LS	LS	LS	LS	LS	LS	LS
Operational noise impacts	LS	LS	LS	LS	LS	LS	LS	LS

SM = Significant Impact, can be Mitigated
LS = Less than Significant Impact
PSM = Potentially Significant Impact, can be Mitigated
SU = Significant Unavoidable Impact
B = Beneficial
N/A = Not Applicable

Construction Noise

Pulgas Site

Construction Equipment Noise. Project implementation would have the potential to generate noise during construction. However, due to the distance between the site and residences to the east and the Filoli residence to the south (0.4 to 0.6 mile), construction noise would not substantially increase ambient noise levels at these residences and therefore would have a less than significant impact on nearby residences. Table IV.K-3 lists maximum noise levels expected from construction equipment, and estimated noise levels at identified sensitive receptors. Project construction would result in temporary noise increases in the Pulgas Water Temple vicinity. Although temple visitors would be subject to these noise increases during the 14-month construction period, construction noise impacts would be less than significant due to their temporary nature. In addition, weddings and special events would not be scheduled during the construction period, further reducing the potential for such noise impacts. Public access to the temple would also likely be restricted for public safety reasons during construction of proposed pipeline segments, diminishing the likelihood of noise conflicts with temple visitors. Although construction noise impacts would be less than significant, use of best available noise control techniques (e.g., improved mufflers, equipment redesign, use of silencers, shields, shrouds, ducts, and engine enclosures) on construction equipment and trucks would help minimize construction-related noise increases. These recommended improvement measures are also described in Section V.N of the mitigation measures chapter.

TABLE IV.K-3
ESTIMATED CONSTRUCTION NOISE LEVELS AT CLOSEST RECEPTORS

Maximum Noise Source	Reference Hourly Leq in dBA @ 50 feet /a/	Actual Distance in feet	Distance Adjustment /b/	Adjusted Leq	Reduction due to Controls	Leq with Controls
Pulgas Water Temple Users - Pipeline Construction Activity Closest to the Temple						
Earthmoving Equipment	85	100	-6	79	-10	69
Trucks	91	100	-6	85	-16	69
Materials Handling	85	100	-6	79	-10	69
Stationary Equipment	81	100	-6	75	-6	69
Impact Equipment	88	100	-6	82	-13	69
Pulgas Water Temple Users - Construction Activity in Existing Parking Lot						
Earthmoving Equipment	85	300	-16	69	-10	59
Trucks	91	300	-16	75	-16	59
Materials Handling	85	300	-16	69	-10	59
Stationary Equipment	81	300	-16	65	-6	59
Impact Equipment	88	300	-16	72	-13	59
Pulgas Water Temple Users - Construction Activity at Dechloramination Facility Site						
Earthmoving Equipment	85	600	-22	63	-10	53
Trucks	91	600	-22	69	-16	53
Materials Handling	85	600	-22	63	-10	53
Stationary Equipment	81	600	-22	59	-6	53
Impact Equipment	88	600	-22	66	-13	53
Residences East of I-280						
Earthmoving Equipment	85	5,500	-41	44	-10	34
Trucks	91	5,500	-41	50	-16	34
Materials Handling	85	5,500	-41	44	-10	34
Stationary Equipment	81	5,500	-41	40	-6	34
Impact Equipment	88	5,500	-41	47	-13	34
Filoli Estate						
Earthmoving Equipment	85	4,200	-38	47	-10	37
Trucks	91	4,200	-38	53	-16	37
Materials Handling	85	4,200	-38	47	-10	37
Stationary Equipment	81	4,200	-38	43	-6	37
Impact Equipment	88	4,200	-38	50	-13	37

Notes:
a. Reference noise levels represent the maximum noise level by equipment type (without controls) at 50 feet, while noise control adjustments represent the difference between the maximum noise levels with controls versus without controls.
b. The distances listed represent the minimum distance between the receptor and the closest facility construction area.

SOURCE: Orion Environmental Associates, 2000

Construction Traffic Noise. Traffic-generated noise increases associated with project construction would occur primarily along Cañada Road between the site and I-280. Except for the Pulgas Water Temple, there are no other noise-sensitive receptors along this road between the site and I-280. The Filoli residence is approximately 900 feet west of Cañada Road. At this distance, construction traffic noise would not exceed the significance criteria, and the impact would be less than significant. When construction-related traffic is added to existing traffic levels on Cañada Road, traffic levels would increase by approximately 10 percent to the north and 7 percent to the south. Such traffic increases would result in noise increases along Cañada Road of approximately 1 dBA. In general, noise increases of 3 dBA are barely perceptible to most people. Therefore, construction-related traffic noise increases on Cañada Road would not significantly increase existing traffic noise levels in the Pulgas Water Temple vicinity. It should be noted that traffic noise at the temple would be reduced by a hillside east of the temple that serves as a barrier to traffic noise from Cañada Road. Thus, noise generated by construction traffic would be a less than significant impact.

Operational Noise

Pulgas Site

Operational Equipment Noise. Operation of the proposed dechloramination facility would generate low levels of noise associated with pumps and interior alarms. Alarms would be low-decibel or visual alarms and would only be audible inside the building. Noise generation potential would depend on the size and number of pumps, but for purposes of analysis, the maximum possible noise level that could be generated by simultaneous operation of multiple pumps would be 85 dBA (Leq)[3] at 50 feet. Pumps would be located inside the chemical building, and the building would reduce pump noise by up to 40 dBA, depending on building design. Concrete block or masonry buildings with no windows and sealed doors can typically reduce noise levels by 40 dBA. When noise reductions due to the intervening distance and the proposed building enclosure are considered, project-related operational noise levels would be less than 10 dBA (Leq) at the closest residences (see Table IV.K-4). Such levels would not exceed the most stringent *San Mateo County Noise Ordinance* exterior noise standards of 55 dBA (L_{50}) during the day and 50 dBA (L_{50}) during the night. At the Pulgas Water Temple, pump operation at the proposed dechloramination facility would generate noise levels of 23 dBA (Leq), if pumps were fully enclosed (see Table IV.K-4). Such noise levels would not exceed the daytime exterior noise standard of 55 dBA (L_{50}). Therefore, no significant noise conflicts would result from facility operation, since recreational uses at the Pulgas Water Temple are restricted to daytime hours.

Standby power for the facility would likely be provided by an emergency, diesel-powered generator. The emergency generator would be used infrequently (during power failures and periodic testing) and enclosed within a building, reducing the potential for long-term noise

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3 It should be noted that chemical pumps are anticipated to be small, generating low noise levels similar to a photocopier. Therefore, this noise level represents the maximum or worst-case noise level that could be generated by simultaneous operation of multiple pumps.

TABLE IV.K-4
OPERATIONAL NOISE LEVELS AT CLOSEST RECEPTORS

Maximum Noise Source	Ref. Hourly Leq in dBA @ 50 feet	Actual Distance in feet	Distance Adjustment	Building Adjustment	Adjusted Leq
Pulgas Water Temple Users - Construction Activity at Dechloramination Facility Site					
Pump Noise	85	600	-22	-40	23
Emergency Generator	85	600	-22	-40	23
Residences East of I-280					
Pump Noise	85	5,500	-41	-40	4
Emergency Generator	85	5,500	-41	-40	4
Filoli Estate					
Pump Noise	85	4,200	-38	-40	7
Emergency Generator	85	4,200	-38	-40	7

SOURCE: Orion Environmental Associates, 2000

impacts. Assuming a noise attenuation rate of 40 dBA, operation of the emergency generator would generate noise levels of less than 10 dBA (Leq) at the closest residences, if pumps were fully enclosed (Table IV.K-4). Such levels would not exceed the most stringent *San Mateo County Noise Ordinance* exterior noise standards of 55 dBA (L_{50}) during the day and 50 dBA (L_{50}) during the night. Thus, use of the emergency generator would be a less than significant impact.

Operational Traffic Noise. Traffic-generated noise increases associated with project operation would occur primarily along Cañada Road between the site and I-280. The only sensitive receptor along Cañada Road is the historic Filoli Estate, approximately 900 feet west of the road. When operational truck traffic is added to existing traffic levels on Cañada Road, noise increases along Cañada Road would be well below 1 dBA. In general, noise increases of 3 dBA are barely perceptible to most people. Therefore, operational traffic noise increases on Cañada Road would not result in a significant noise impact on the Filoli Estate, and operational noise impacts would be less than significant.

REFERENCES – Noise

County of San Mateo, Department of Environmental Management, *General Plan for San Mateo County, Man-Made Hazards Background,* November 1986.

U.S. Environmental Protection Agency (USEPA), *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*, 1974.

CHAPTER V
MITIGATION MEASURES

This chapter describes proposed mitigation measures for the significant and potentially significant environmental impacts identified in Chapter IV, as required under the California Environmental Quality Act (CEQA). As described below, implementation of the mitigation measures would reduce the identified impacts to less than significant. Mitigation measures are presented under two main categories. "Measures proposed as part of the project" are those incorporated into the project by the San Francisco Public Utilities Commission (SFPUC). "Measures identified in this report" are those that are not included in the project, but could reasonably be expected to reduce the adverse impacts of the project if required as conditions of approving the project. This chapter also includes mitigation measures that were previously identified in the Initial Study prepared for this project (see Appendix A).

In addition to mitigation measures, this chapter describes recommended improvement measures for some impacts that were identified in Chapter IV as less than significant. These improvement measures, while not required under CEQA to mitigate identified significant impacts, could reduce minor adverse effects or temporary disruption associated with the implementation of the proposed project.

A. PLANS AND POLICIES

No significant or potentially significant impacts have been identified, and no mitigation is required.

B. LAND USE AND RECREATION

1.0 MITIGATION MEASURES PROPOSED AS PART OF THE PROJECT

None.

2.0 MITIGATION MEASURES IDENTIFIED IN THIS REPORT

Mitigation Measures F-1, F-2, and F-3, under Section V.F, Aesthetics, would reduce potentially significant effects of the project on the existing character of the Pulgas site vicinity to a less than significant level.

C. BIOLOGICAL RESOURCES

1.0 MITIGATION MEASURES PROPOSED AS PART OF THE PROJECT

None. (Measures to site facilities away from sensitive habitats are considered part of project planning and design and are therefore not listed as mitigation measures.)

2.0 MITIGATION MEASURES IDENTIFIED IN THIS REPORT

Wetlands Impacts

The following mitigation measure addresses potential loss or disturbances to wetlands at the Tesla Portal, San Antonio Pump Station, Alameda East Portal, and Pulgas sites:

C-1 The applicant shall implement the following regulatory compliance measures to reduce the significance of this impact:

a. A wetland delineation shall be performed, by a qualified biologist, of all indicated "waters of the U.S.," including wetlands and nonwetland water resources, to map and identify wetland acreage in the project area and to serve as a basis for avoidance or permitting (see C-1b, below). The delineation shall be conducted prior to any construction within or adjacent to potential jurisdictional wetlands and nonwetland water resources, such as runoffs, seasonal ponding areas, permanent ponded areas, and stream segments. If wetlands and nonwetland water sources are determined to be nonjurisdictional upon completion of a delineation, then no further mitigation would be necessary.

b. Upon verification of a wetland delineation, if wetlands or nonwetland water sources are determined to be jurisdictional by the California Department of Fish and Game (CDFG) and/or the U.S. Army Corps of Engineers (Corps), project facilities would be sited to avoid these areas, if possible.

c. If complete wetland avoidance is not possible, a permit shall be obtained from the Corps; a Regional Water Quality Control Board (RWQCB) waiver/certification shall be acquired from the local RWQCB proponent; and a Streambed Alteration Agreement (SAA) shall be negotiated with the CDFG under Section 1601 of the Fish and Game Code for temporary or permanent construction within a jurisdictional wetland or water-related feature. In general, for projects that are substantially similar in nature and/or have minimal individual or cumulative adverse effects on waters of the U.S. and comply with Nationwide permit conditions, a Nationwide 404 permit would be filed and the Corps notified, depending on the type of permit. Typically, projects of this nature would be permitted by the Corps under Nationwide Permit No. 12, Utility Line

Bedding and Backfill, and No. 18, Minor Discharges. The more "general use" permit, No. 26, might also be appropriate.[1]

d. If the amount of habitat affected exceeds the minimum threshold established for the permit, habitat shall be replaced (including jurisdictional wetlands and nonwetland water resources) at a 3:1 ratio, or at a similar ratio determined by the Corps and CDFG and required as a condition of the aforementioned permits. Replacement habitat shall be comparable to habitat affected by the project (e.g., freshwater marsh would be mitigated by creation of a freshwater marsh, not annual grasslands). The preferable location for on-site habitat replacement would be within the Crystal Springs Reservoir watershed. Temporary impacts shall be similarly mitigated. The project shall strictly adhere to a "no net loss" wetlands policy.

Implementation of Mitigation Measure C-1 would reduce potential wetlands impacts to a less than significant level.

Special-Status Species Impacts

The following mitigation measures address potential impacts to special-status species associated with upland and wetland habitats at the Tesla Portal, Alameda West Portal, and Pulgas sites:

C-2 In order to avoid potential impacts to burrowing owl and San Joaquin kit fox at the Tesla Portal site, several avoidance and mitigation measures shall be applied. To determine site use, a preconstruction survey for burrowing owls shall be conducted by a qualified biologist, in accordance with protocol found in the *Staff Report on Burrowing Owl Mitigation* (CDFG, 1995). Surveys shall cover grassland areas within a 500-foot buffer and check for adult and juvenile burrowing owls and their habitat. If owls are detected during surveys, occupied burrows shall not be disturbed. Similar surveys shall be performed for San Joaquin kit fox, in accordance with protocol found in the U.S. Fish and Wildlife Service (USFWS) *Standardized Recommendations for Protection of the San Joaquin Kit Fox Prior to or During Ground Disturbance* (USFWS, 1997a), or more current avoidance protocols.

C-3 If occupied burrowing owl habitat is detected on or adjacent to the Tesla Portal site, measures to avoid, minimize, or mitigate impacts to burrowing owls shall be incorporated into the project. Such measures include the following:

a. Sensitive areas shall be established around the occupied burrows where no disturbance may occur. During the nonbreeding season (September 1 through January 31), the sensitive areas shall extend 160 feet around the occupied burrows.

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1 Nationwide Permit 26 expires on June 5, 2000. The Corps issued a Public Notice on March 9, 2000 stating that Pre-Construction Notifications (PCNs) submitted on or before March 9, 2000 will be reviewed under the existing terms and conditions of Nationwide Permits (NWPs), and that afterward, new applications or requests for authorization will be subject to the revised or new NWP requirements. Most new NWPs require submission of a PCN for discharges of dredged or fill material that result in the loss of greater than 1/10 acre of waters of the U.S. The maximum acreage limits for most of the new and modified NWPs is 1/2 acre.

During the breeding season (February 1 through August 31), sensitive areas shall extend 250 feet around occupied burrows.

b. If the above avoidance requirements cannot be met, passive relocation of on-site owls may be implemented as an alternative, but only during the nonbreeding season. Passive relocation shall be accomplished by installing one-way doors on the entrances of burrows located within 160 feet of the project site. The one-way doors shall be left in place for 48 hours to ensure that the owls have left the burrows.

c. For each burrow that may be excavated by project construction, one alternate unoccupied, natural or artificial burrow shall be provided outside of the 160-foot buffer zone. The alternate burrows shall be monitored daily for one week to confirm that owls have moved and acclimated.

d. Burrows within the construction area shall be excavated using hand tools, under the supervision of a biological monitor, and then refilled to prevent reoccupation. If any burrowing owls are discovered during excavation, the excavation shall cease and the owl allowed to escape. Excavation may be completed when the biological monitor confirms that the burrow is empty.

e. Concurrently with the San Joaquin kit fox education program (see Measure C-4g, below), a qualified biologist shall provide information on the burrowing owl to contractors, their employees, and agency personnel involved in the project, including the following: a description of the burrowing owl and its habitat needs; its occurrence in the project area; and measures being taken to reduce impacts to the species during project construction and implementation.

C-4 Measures to avoid, minimize, or mitigate impacts to kit foxes at the Tesla Portal site shall be incorporated into the project. Such measures would be derived from the USFWS *Standardized Measures* (USFWS, 1997) and would include, at a minimum, the following conditions:

a. Upon informal consultation with the Sacramento field office of the USFWS, a preconstruction survey shall be conducted for the San Joaquin kit fox in and surrounding the project site. The survey for potential kit fox dens would be performed by a qualified biologist 14-30 days prior to the commencement of construction activities. All identified potential dens shall be monitored for evidence of kit fox use by placing a tracking medium at den entrances and monitoring for at least three consecutive nights. If no activity is detected at these dens, they may be closed (with prior concurrence from the USFWS).

b. If a den is determined to be occupied, den closure activities shall immediately be halted and the USFWS contacted. Mitigation measures for impacts to the den may include seasonal limitations on project construction at the site (i.e., restricting the construction period to avoid the spring-summer pupping season).

c. To minimize the possibility for inadvertent kit fox mortality, project-related vehicles shall observe a maximum 20-mile-per-hour speed limit on private roads near the Tesla Portal site. To the extent possible, nighttime construction shall be minimized at this site. Off-road traffic outside the designated project area shall be prohibited in areas that provide kit fox habitat.

d. To prevent accidental entrapment of kit fox or other animals during construction, all excavated or deep-walled holes or trenches greater than 2 feet deep shall be covered at the end of each workday by plywood or similar materials, or provided with escape routes constructed of earth fill or wooden planks. Before such holes are filled they shall be thoroughly inspected for trapped animals. If trapped animals are discovered, a qualified biologist shall be consulted regarding release procedures.

e. All food-related trash items such as wrappers, cans, bottles, and food scraps shall be disposed of in closed containers and removed at least once a week from the project site.

f. To prevent harassment, mortality of kit foxes, or destruction of dens, no pets shall be allowed on the project site.

g. An employee education program shall be conducted for the project to explain endangered species concerns to contractors, their employees, and agency personnel involved in the project. The program shall consist of a brief presentation by persons knowledgeable in kit fox biology and legislative protection and shall include the following: a description of the San Joaquin kit fox and its habitat needs; the occurrence of kit fox in the project area; status of the species and its protection under the state and federal endangered species acts; legal provisions for violating state and federal species-protection laws; and measures being taken to reduce impacts to the species during project construction and implementation. A fact sheet conveying this information shall be prepared for distribution to the above-mentioned people and anyone else who may enter the project site.

C-5 Implementation of the following measure would reduce or eliminate potential "taking" of California tiger salamander as a direct result of project construction at the Alameda West Portal site. If construction activities remain within the fenced portion of the Alameda West Portal site, then no mitigation measures would be required for impacts to this species.

a. Preconstruction surveys within 48 hours prior to ground-disturbing activity shall be conducted by a qualified biologist within the pastureland portion of the site and a 200-foot buffer. Surveys shall be completed for adult California tiger salamander and aestivation burrows that may occur within the project area. If no burrows are detected during these surveys, then construction-related activities may proceed. If adult California tiger salamander burrows are found within the construction disturbance zone, they shall be excavated and any salamanders passively displaced

from the area of disturbance. Salamanders would be relocated by a qualified biologist to suitable nearby habitat that would not be affected by the project activities. If necessary to prevent animals from entering the site (e.g., following winter and spring rains), silt fencing shall be constructed around the perimeter of the site using t-posts. The fence shall be partially buried with dirt or gravel to inhibit salamander movement.

C-6 The following measures would reduce the potential for impact to a less than significant level and avoid an incidental "take" of California red-legged frog and San Francisco garter snake at the Pulgas site. Project components at the Pulgas site would not substantially alter habitat for California red-legged frog and San Francisco garter snake.

a. An informal consultation shall be arranged with the USFWS prior to project implementation to ensure that all potential impacts to California red-legged frog and San Francisco garter snake have been addressed. Additional measures may be required by the USFWS, including a formal Section 7 consultation under the Endangered Species Act, in which case the measures listed below would be supplemented with additional requirements.

b. A USFWS-approved biologist shall survey the area immediately preceding construction (i.e., within 24 hours), or before fencing is erected (see below). The removal of frogs or snakes from the work site or from within the exclusion fence would occur following approval by the USFWS for relocation of individuals. The biologist shall be available during construction as an on-site monitor and to provide training.

c. Before construction begins, the biologist shall describe to construction crews the measures taken to avoid impacts to the species. An employee education program shall be conducted to explain endangered species concerns to contractors, their employees, and agency personnel involved in activities that could affect California red-legged frog or San Francisco garter snake. The program shall consist of a brief presentation by persons knowledgeable in species biology and legislative protection and shall include the following: a description of each species and its habitat needs; the occurrence of each species in the project area; status of the species and its protection under the state and federal endangered species acts; legal provisions for violating state and federal species-protection laws; and measures being taken to reduce impacts to the species during project construction and implementation. A fact sheet conveying this information shall be prepared for distribution to the above-mentioned people and anyone else who may enter the project site.

d. The work area shall be fenced with USFWS-approved frog- and snake-proof barriers, such as mesh fencing, or 4- x 8-foot plywood panels joined lengthwise.

e. During project activities, all trash that could attract predators shall be removed from the work site and disposed of daily.

f. If disturbed, riparian habitats shall be restored as described under Mitigation Measure C-10, below.

C-7 To protect breeding bats at the Pulgas site, preconstruction surveys and avoidance measures shall be implemented. To minimize effects on bat species, large trees and riparian vegetation (which serve as important foraging habitat) shall be retained to the greatest extent possible. To avoid impacts during the reproductive season of bats, tree removal shall not occur between May 1 and September 15. If clearing is to occur during the reproductive season, a general survey for bats and bat roosts shall be conducted by a qualified biologist prior to construction to verify bat absence on the project site. If the survey indicates the potential presence of breeding bats, the results would be coordinated with the Region 3 office of the CDFG, and suitable avoidance measures would be developed. Construction activities shall observe buffer zones of at least 250 feet near active bat roosts.

By avoiding a direct "take" of special-status-species and coordinating project activities closely with the USFWS and CDFG, implementation of Mitigation Measures C-2 through C-7 would reduce potential impacts on special-status species to a less than significant level.

Aquatic Habitat Impacts

The following mitigation measure addresses potential impacts to the aquatic habitats present in San Andreas Reservoir:

C-8 The assumption that overflows and planned water transfers to San Andreas Reservoir are sufficiently low in volume, frequency, and/or ammonia concentration to avoid algal stimulation without prior ammonia removal (dechloramination) shall be verified.

The SFPUC shall monitor overflows from Harry W. Tracy Water Treatment Plant to determine the volume and frequency of overflows to San Andreas Reservoir that could occur downstream of chlorine and ammonia addition. Monitoring of residual ammonia levels in overflows and other water quality conditions in San Andreas Reservoir shall be conducted to determine if residual ammonia levels would promote algal stimulation and eutrophic conditions. If monitoring indicates that water quality of San Andreas Reservoir may be affected by incremental increases in nitrogen from treated water overflows, the SFPUC would implement measures to improve nutrient management in San Andreas Reservoir, such as the following: oxygenation/aeration (to counteract increased oxygen demand and sediment nutrient recycling); control of watershed nutrients (to offset increased sediment nutrient recycling); diversion of overflows to another holding area; or reduction of ammonia levels in overflows. See also Section V.D, Hydrology and Water Quality.

Implementation of Mitigation Measure C-8 would avoid or reduce project impacts to aquatic habitats and thereby reduce this impact to a less than significant level.

Nesting Raptor and Passerine Bird Impacts

The following mitigation measure addresses potential impacts to nesting raptors and passerine birds at the San Antonio Pump Station, Alameda East Portal, Alameda West Portal, and Pulgas sites:

C-9 Tree and brush removal at the above-identified project sites shall be avoided during the nesting season (March 1 through August 15), or the sites shall be surveyed by a qualified biologist to verify the absence of breeding birds.

Initial site clearing shall also occur outside of the nesting season (March 1 through August 15). If clearing within the project area is to occur during the nesting season, a general survey for raptors, passerines, and their nests shall be conducted by a qualified biologist prior to construction to verify bird absence. If the survey indicates the potential presence of nesting raptors or passerines, the results would be coordinated with the Region 3 office of the CDFG, and suitable avoidance measures would be developed. Construction activities shall observe CDFG avoidance guidelines, which are a minimum 500-foot buffer zone surrounding active raptor nests and a 250-foot buffer zone surrounding nests of other birds.

Implementation of the Mitigation Measure C-9 would thus reduce the impact to nesting birds to a less than significant level.

Vegetation Communities Impacts

The following mitigation measure addresses impacts to significant vegetation communities at the Pulgas site:

C-10 Impacts to willow riparian habitat shall be mitigated by replacement at a 3:1 ratio, or at a similar ratio determined by the CDFG. If avoidance of the identified plants is infeasible, the project proponent shall prepare and implement a revegetation plan and a five-year monitoring plan to restore native willow riparian habitat elsewhere in the project vicinity to a self-sustaining, ecologically functioning plant community, in coordination with the CDFG and California Native Plant Society. This action would be sensitive to the habitat needs of the California red-legged frog and San Francisco garter snake and thus would require input from the USFWS.

The monitoring program shall be designed to ensure that the replacement habitats are comparable in quality and quantity to sensitive habitats that are disturbed by project construction. The long-term survival of mitigation plantings and restoration of lost habitat for the California red-legged frog and San Francisco garter snake shall be the goals of mitigation plantings. The success of the mitigation plantings shall be assessed periodically over five years to determine the degree to which the functional replacement of natural habitats has been achieved. At the end of five years, the Corps and CDFG shall be consulted to determine if the mitigation goals have been met; if the goals have been met, no further action would be required. If mitigation goals have not been met, the

SFPUC shall comply with the agencies' requirements for additional action to ensure that habitat replacement is carried out at the mitigation site.

The revegetation plan shall include plant salvage, seeds, and seedlings obtained from local native sources and irrigation, as necessary. The following performance standards are suggested for the revegetation plan: (1) vegetation should have no less than 80 percent survival rate; (2) there should be no excessive rills, gullies, or other erosion features; (3) there should be no noxious or invasive species; (4) a properly functioning irrigation system should be installed; and (5) mitigation ratio of plants should be based on then-current acceptable protocol.

The five-year monitoring plan shall include annual monitoring using standard ecological methods to estimate plant cover and to document survival rates and growth characteristics and shall be reviewed by appropriate agencies. At the end of this period, the success of the restoration effort shall be assessed against the restoration goals (e.g., at least 80 percent survival of plantings, 75 percent vegetative cover by desirable species, and a viable, self-sustaining plant community). Based upon final restoration performance, a determination shall be made, in coordination with the Corps, as to whether or not the project achieved the final mitigation goals and whether additional mitigation is required following the five-year monitoring period.

Implementation of the Mitigation Measure C-10 would compensate for the loss of willow riparian habitats and thereby reduce this impact to a less than significant level.

Invasive Landscape Plant Species Impacts

The following mitigation measure addresses potential impacts related to invasive landscape plant species at the Pulgas site:

C-11 As part of the site clearing and grubbing for construction, identified invasive plant species (e.g., yellow-star thistle, purple-star thistle, or french broom) shall be removed prior to seed germination (before June) so that seeds of these plants are not dispersed within the project area. Disturbed natural areas as a result of construction shall be revegetated with appropriate native herbaceous or woody species. Revegetation shall begin as soon as construction-related activities are completed. Monitoring of the seeded herbaceous areas would occur prior to the first wet season following revegetation to ensure that sufficient ground coverage has developed.

Native species should be used in revegetation. If nonnative plant species are included in the revegetation planting palette, certain plants must be avoided. These plants are listed in Table V-1.

TABLE V-1
PLANT SPECIES THAT MAY NOT BE USED IN PROJECT LANDSCAPING

Pampas grass (*Cortaderia jubata, C. selloana*)	Mattress vine (*Muelenbeckia complexa*)
Tree-of-heaven (*Ailanthus altissima*)	Tree tobacco (*Nicotiana glauca*)
Giant reed (*Arundo donax*)	Fountain grass (*Pennisetum setaceum*)
Bamboo (*Bambusa* spp., *et al*)	Pyracantha (*Pyracantha angustifolia*)
Cotoneaster (*Cotoneaster pannosa*)	Castor bean (*Ricinus communis*)
French broom (*Cytisus monspessulanus*)	Black locust (*Robinia pseudoacacia*)
Scotch broom (*Cytisus scoparius*)	Cape ivy (*Delaira odorata*)
Blue gum (*Eucalyptus globulus*)	Spanish broom (*Sparteum junceum*)
English ivy (*Hedera helix*)	Tamarisk (*Tamarix* spp.)
Fig-marigold family members (*Conicosia, Mesembryanthemum*, and *Carpobrotus*)	Gorse (*Ulex europaeus*)
	Periwinkle (*Vinca major*)
Tall fescue (*Festuca arundinacea*)	Purple fountain grass (*Pennisetum setaceum)*

SOURCE: ESA, 1999

Implementation of the Mitigation Measure C-11 would reduce impacts related to invasive landscape plant species to a less than significant level.

D. HYDROLOGY AND WATER QUALITY

1.0 MITIGATION MEASURES PROPOSED AS PART OF THE PROJECT

In most cases, water quality control measures are included as part of project planning and design, and are therefore not listed as mitigation measures.

Degradation of Water Quality due to Secondary System Releases

The following mitigation measure shall be implemented to mitigate potential water quality impacts associated with controlled secondary discharges or planned water transfers to Lake Merced:

D-1 The SFPUC shall perform a site-specific water quality study to examine the potential impact of increased levels of ammonia to Lake Merced. The study shall evaluate the potential for algal stimulation to occur, if ammonia at levels that would be present in the chloraminated water were discharged to Lake Merced. Based on results of the study, the SFPUC shall develop allowable discharges to the lake that would protect water quality, given the anticipated ammonia residual following dechlorination. Any discharges or water transfers of chloraminated drinking water to Lake Merced shall be consistent with the recommendations of the water quality study. In the event that the water quality study determines that Lake Merced could be adversely affected by the increases in ammonia levels, the SFPUC shall ensure protection of Lake Merced water quality, such as by

removing or reducing the levels of ammonia in the drinking water prior to discharge (e.g, by constructing a dechloramination facility), eliminating discharges of chloraminated water, or using alternate water supplies for water transfers to Lake Merced.

The study shall begin during the design phase of the proposed project. In the event that the study is not completed prior to implementation of chloramine conversion, the SFPUC shall suspend planned discharges of drinking water to Lake Merced until completion of the water quality study and shall identify alternate water sources for possible water transfers to Lake Merced.

Implementation of Mitigation Measure D-1 would reduce potential water quality impacts on Lake Merced to a less than significant level.

2.0 MITIGATION MEASURES IDENTIFIED IN THIS REPORT

Operational Discharge Impacts to Water Quality

Mitigation Measure C-8 under, Section V.C, Biological Resources, would reduce potentially significant water quality impacts to San Andreas Reservoir from overflows at the Harry W. Tracy WTP to a less than significant level.

Operational Discharge Impacts to Water Quality from BAWUA Agencies' Systems

The following program-level mitigation measure should be adopted and implemented by Bay Area Water Users Association (BAWUA) member agencies:

D-2 BAWUA member agencies should conduct a comprehensive evaluation of their individual systems to determine specific water quality control measures to prevent discharge of harmful substances to local water bodies. At a minimum, the BAWUA agencies should include the following measures, similar to those included in the SFPUC proposed project: dechlorination facilities for overflows and secondary discharges of chloraminated water; secondary containment for all chemical loading and storage facilities; adequate separation of incompatible chemicals; water quality studies to determine algal stimulation potential for sensitive water bodies subject to discharge of chloraminated water; emergency response procedures in the event of system failures; and construction provisions for erosion and sedimentation control and for release of chemicals or fuels to water bodies.

Implementation of Mitigation Measure D-2 would reduce potential water quality impacts from BAWUA agencies' systems to a less than significant level.

E. PUBLIC HEALTH AND WATER SUPPLY

No potentially significant or significant impacts have been identified, and no mitigation is required. Planning and design measures included in the project address public health and water supply concerns and are therefore not listed as mitigation measures.

F. AESTHETICS

1.0 MITIGATION MEASURES PROPOSED AS PART OF THE PROJECT

None.

2.0 MITIGATION MEASURES IDENTIFIED IN THIS REPORT

Negative Aesthetic Effects

The following mitigation measures address potentially significant impacts on the visual character of the Pulgas site:

F-1 In consultation with the SFPUC Land and Resources Management Section, the SFPUC shall prepare and implement a landscaping plan for the Pulgas site. Disturbed areas shall be revegetated to minimize textural contrasts with the surrounding vegetation. New plants should include noninvasive grasses, shrubs, and trees typical of the surrounding area (refer also to Section V.C, Biological Resources, Mitigation Measure C-11). The new plantings and landscape berms should screen the chemical building to the extent possible when construction is complete. In accordance with Mitigation Measure C-10 in Section V.C, Biological Resources, above, the SFPUC shall monitor landscape plantings annually for five years after project completion to ensure that sufficient ground coverage has developed and shall implement additional measures, such as replanting or modifying irrigation systems, as determined necessary. At the end of this period, the success of the landscape plan shall be assessed for effective, long-term screening of the dechloramination facility. The SFPUC, in coordination with the Land and Resources Management Section, shall incorporate long-term landscape maintenance of the dechloramination facility with ongoing landscaping at the Pulgas Water Temple.

F-2 The SFPUC shall use design elements to enhance visual integration of the dechloramination facility with its surroundings. The proposed building shall be painted low-glare colors that blend with the terrain. The SFPUC Land and Resources Management Section shall be consulted on building design.

F-3 The SFPUC shall ensure that its contractors restore disturbed areas along the pipeline alignment to their preproject condition such that short-term construction disturbance does not result in long-term visual impacts. The SFPUC shall retain in-place landscaping to the extent possible to screen the project facilities from public areas in the vicinity of the Pulgas Water Temple. The contractors shall replace any construction-affected

landscaping with equivalent vegetation and recontour any disturbed land to match preconstruction conditions. See also Section V.G, Cultural Resources.

Implementation of Mitigation Measures F-1, F-2, and F-3 would reduce potentially negative aesthetic effects at the Pulgas site to a less than significant level.

Degradation or Obstruction of Scenic Views

The following mitigation measures address the potentially significant effects on views from Cañada Road that would result from construction of the dechloramination facility at the Pulgas site:

F-4 To reduce visual intrusion, the design for the proposed building shall incorporate architectural elements (e.g., slanted roof) that minimize the industrial appearance and make the building more compatible with its rural setting. The SFPUC Land and Resources Management Section shall be consulted on building design.

F-5 A decorative gate shall be constructed at the entrance to the road to effectively screen views of the dechloramination facility from Cañada Road. The gate shall be designed to provide adequate screening without appearing too solid or bulky. The SFPUC Land and Resources Management Section shall be consulted on the gate design.

● F-6 The access road shall be designed to minimize both the removal of existing native plants and the number of new plantings needed to provide screening. The entry road shall be curved, and natural-appearing berms shall be graded in appropriate locations that screen views of the facility from Cañada Road. New plantings shall be placed on top of the berm to eventually screen views of the proposed building.

F-7 Additional trees shall be planted south of the proposed building site along Cañada Road to supplement the screening provided by existing trees. These additional trees shall be planted shortly after construction commences and shall be maintained and protected during the construction period. These trees shall be incorporated into the landscaping plan and shall be monitored for one year following construction, as stated in Mitigation Measure F-1, above, and any trees not surviving shall be replaced.

F-8 The SFPUC shall conduct further study of the proposed alignment to identify any adjustments that would minimize the removal of existing trees that serve to screen the site from Cañada Road. A qualified arborist shall be consulted regarding the minimum buffers required to prevent root damage to remaining trees and to provide the SFPUC with any necessary maintenance requirements for remaining trees.

Implementation of Mitigation Measures F-4, F-5, F-6, F-7, and F-8 would reduce potential impacts to scenic views to a less than significant level.

G. CULTURAL RESOURCES

1.0 MITIGATION MEASURES PROPOSED AS PART OF THE PROJECT

See Mitigation Measure G-4 for description of a measure included as part of the project, but augmented as identified in this report in order to reduce potentially significant impact to a less than significant level.

2.0 MITIGATION MEASURES IDENTIFIED IN THIS REPORT

Construction Impacts to Archaeological Resources

The following measure addresses potential impacts to cultural resources associated with project construction at the Tesla Portal, San Antonio Pump Station, Alameda East and West Portals, Pulgas, and Harry W. Tracy WTP sites:

- G-1 In the event of an inadvertent discovery of a cultural resource during construction at the Tesla Portal, San Antonio Pump Station, Alameda East and West Portals, and Harry W. Tracy sites, work within 25 feet of the find shall be stopped and a professional archaeologist shall be contacted to evaluate cultural resources and to determine appropriate treatment. The contractor shall comply with the recommendations of the archaeologist before resuming construction.

- Given the location and depth of excavation proposed at the Pulgas site and the likelihood that archaeological resources would be encountered, the sponsor shall retain the services of an archaeologist. The archaeologist shall carry out a pre-excavation testing program to better determine the probability of finding cultural and historical remains. The testing program would use a series of mechanical, exploratory borings or trenches, and/or other testing methods determined by the archaeologist to be appropriate. The testing shall be terminated if the archaeologist determines, from subsurface inspections, that the area has been filled or disturbed during prior work.

- If, after testing, the archaeologist determines that no further investigations or precautions are necessary to safeguard potentially significant archaeological resources, the archaeologist shall submit a written report to the Environmental Review Officer (ERO), with a copy to the project sponsor. If the archaeologist determines that further investigations or precautions are necessary, he/she shall consult with the ERO, and they shall jointly determine what additional procedures are necessary to minimize potential effects on archaeological resources.

- These additional procedures would be implemented by the project sponsor and could include a program of on-site monitoring of all site excavation, during which the archaeologist would record observations in a permanent log. The monitoring program, whether or not there are finds of significance, would result in a written report to be

- submitted first and directly to the ERO, with a copy to the project sponsor. During the monitoring program, the project sponsor would designate one individual as his/her on-site representative. This representative would have the authority to suspend work at the site to give the archaeologist time to investigate and evaluate archaeological resources, should they be encountered.

- Should evidence of cultural resources of potential significance be found during the monitoring program, the archaeologist shall immediately notify the ERO, and the project sponsor shall halt any activities that the archaeologist and ERO jointly determine could damage such cultural resources. Ground-disturbing activities that might damage cultural resources would be suspended for a total maximum of four weeks over the course of construction.

- After notifying the ERO, the archaeologist would prepare a written report to be submitted first and directly to the ERO, with a copy to the project sponsor, which would contain an assessment of the potential significance of the find and recommendations for what measures should be implemented to minimize potential effects on archaeological resources. Based on this report, the ERO would recommend specific additional mitigation measures to be implemented by the project sponsor. These additional mitigation measures could include a site security program, additional on-site investigations by the archaeologist, and/or documentation, preservation, and recovery of cultural material.

- Finally, the archaeologist would prepare a report that documents the cultural resources discovered, evaluates their significance, and describes how any archaeological testing, exploration, and/or recovery program was conducted.

- Copies of all draft reports prepared according to this mitigation measure would be sent first and directly to the ERO for review. Following approval by the ERO, copies of the final report(s) would be sent by the archaeologist directly to the President of the Landmarks Preservation Advisory Board and the California Historical Resources Information System, Northwest Information Center, Sonoma State University, Rohnert Park. Three copies of the final archaeology report(s) shall be submitted to the Office of Environmental Review, accompanied by copies of the transmittals documenting its distribution to the President of the Landmarks Preservation Advisory Board and the California Historical Resources Information System, Northwest Information Center, Sonoma State University, Rohnert Park.

Implementation of Mitigation Measure G-1 would reduce potential construction impacts to archaeological resources to a less than significant level.

Construction Impacts to Architectural Resources

The following measures address potential long-term impacts to architectural resources associated with project construction at the Pulgas site:

G-2 In order to address short-term construction impacts at the Pulgas Water Temple associated with dust accumulation on the building facade and with increased noise and vibration from construction equipment:

a. Cleaning of the historic building and associated structures may be necessary after construction activities to prevent long-term damage to the building fabric. The need for cleaning shall be determined by a qualified historic architect, shall follow the standards set by the Secretary of the Interior, and shall be completed in consultation with the historic architect.

b. A structural engineer shall inspect the building and any other built features prior to construction to determine if the noise and vibration anticipated during construction will affect the building's framework and fabric. The report, with any recommendations and mitigation measures, shall be reviewed by a qualified historic architect, and the SFPUC shall implement the recommendations and mitigation measures deemed necessary by the qualified historic architect prior to construction.

c. If determined necessary by the historic architect, construction-related noise control measures listed in Section V.N would be implemented. Refer also to construction-related air pollutant emissions mitigation measures for dust and exhaust emissions control listed in Section V.L.

Mitigation Measure F-3 under Section V.F, Aesthetics, would reduce potentially significant construction impacts on landscaping at the Pulgas Water Temple and its setting to a less than significant level. Implementation of Mitigation Measures G-2 and F-3 would reduce potential long-term impacts to the Pulgas Water Temple due to construction activities to a less than significant level.

Operational Impacts to Architectural Resources

The following measure addresses potential cultural resource impacts at the Pulgas Water Temple associated with project operation:

- G-3 The SFPUC shall, as part of the project, maintain as much of the existing sound and appearance of rushing water through the Pulgas Water Temple as is feasible, given operational requirements of the water system. The pattern, amounts, appearance, and sounds of the current flow regime shall be documented to establish existing baseline conditions, and a system shall be incorporated into the project (such as a system that pumps water through the temple) to simulate the existing conditions. It is expressly understood that, currently, flows vary from none to considerable, depending on operational requirements of the overall system. All alterations to the temple shall be performed in accordance with applicable Secretary of the Interior's *Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings* (Weeks and Grimmer, 1995).

- Implementation of Mitigation Measure G-3 would reduce potential operational impacts to the Pulgas Water Temple to a less than significant level.

H. GEOLOGY AND SEISMICITY

1.0 MITIGATION MEASURES PROPOSED AS PART OF THE PROJECT

Seismic Hazard – Ground Rupture

The following mitigation measure addresses the significant or potentially significant effects of ground rupture at the San Antonio Pump Station, Alameda East Portal, Alameda West Portal, and Pulgas sites:

H-1 The SFPUC shall ensure that a fault investigation is conducted at each of the facilities within an Alquist-Priolo Earthquake Fault Zone. Fault investigations have been conducted at the San Antonio Pump Station and Harry W. Tracy WTP sites. Additional trenching shall be required to evaluate the potential for fault rupture at the Alameda West

Portal site. Review of the fault investigations and the proposed locations of any new facilities by the local regulatory agency responsible for issuing building permits would ensure that none of the project components would be constructed within 50 feet of an active fault trace.

The following mitigation measure addresses the potentially significant effects of ground rupture at the Tesla Portal site:

H-2 The project sponsor shall ensure that more extensive review and analyses, along with geomorphic reconnaissance and mapping, aerial photograph interpretations, borings, seismic surveys, and trenching, are conducted to define the San Joaquin fault and the potential magnitude of deformation within the proposed construction areas at the Tesla Portal. None of the proposed project components shall be constructed within an area where ground rupture would be expected. The final determination shall be made by the permitting agency that reviews the geotechnical information to ensure that the potential for ground rupture has been adequately addressed.

Implementation of Mitigation Measures H-1 and H-2 would reduce impacts related to seismic ground rupture to a less than significant level.

Seismic Hazard – Ground Shaking

The following mitigation measure addresses the significant or potentially significant effects of ground shaking at each of the proposed project sites:

H-3 Geotechnical investigations have been conducted at the Tesla Portal, San Antonio Pump Station, Alameda West Portal, and Pulgas sites to estimate the degree of ground shaking that could be expected in the event of the controlling seismic event that could affect the proposed project site. On the basis of the results of each of these investigations, appropriate seismic design criteria from the Uniform Building Code have been identified on the basis of soil type, magnitude of the controlling seismic event, slip rate of the nearest fault, and distance to the nearest fault. The SFPUC shall ensure that similar investigations are conducted for the Alameda East Portal and Harry W. Tracy WTP sites. For each site, the recommendations regarding Uniform Building Code seismic design criteria shall be incorporated into the final design of the project, which would be reviewed and approved by the local permitting agency responsible for issuing building permits.

Implementation of Mitigation Measure H-3 would reduce impacts related to seismic ground shaking to a less than significant level.

Unstable Cut-and-Fill Slopes

The following mitigation measure addresses the potentially significant effect of unstable cut-and-fill slopes at the Tesla Portal and Harry W. Tracy WTP sites:

H-4 A geotechnical investigation shall be conducted at the Harry W. Tracy WTP to determine the safe inclination of the cut or fill slope, based on the facility to be constructed, the geologic materials involved, and the height of the cut or fill. This investigation has already been conducted at the Tesla Portal. The project sponsor shall incorporate into contract documents the requirement that the construction contractor follow the geotechnical engineer's recommendations to maintain stability of all temporary or permanent cut-and-fill slopes, which could require construction of a retaining wall.

Implementation of Mitigation Measure H-4 would reduce impacts related to unstable cut-and-fill slopes to a less than significant level.

2.0 MITIGATION MEASURES IDENTIFIED IN THIS REPORT

None.

I. HAZARDOUS MATERIALS

1.0 MITIGATION MEASURES PROPOSED AS PART OF THE PROJECT

None.

2.0 MITIGATION MEASURES IDENTIFIED IN THIS REPORT

Chemicals in Soils

The following mitigation measure applies to the potentially significant impact of encountering petroleum hydrocarbons at the Harry W. Tracy WTP site:

I-1 The SFPUC shall review the location of the former underground storage tank at the plant. If construction would occur in the location of the former tank, available data shall be reviewed to assess the concentrations of petroleum hydrocarbons remaining in place. If warranted, the construction contractor(s) shall be required to prepare a site health and safety plan and to manage and dispose of the soil in accordance with all applicable laws and regulations.

Implementation of Mitigation Measure I-1 would reduce the impact related to the potential to encounter hazardous materials during construction at the Harry W. Tracy WTP site to a less than significant level.

J. TRANSPORTATION

No significant or potentially significant impacts have been identified, and no mitigation is required.

K. NOISE

No significant or potentially significant impacts have been identified, and no mitigation is required.

L. AIR QUALITY

1.0 MITIGATION MEASURES IDENTIFIED IN THE INITIAL STUDY

The following measures for mitigating emissions of air pollutants during project construction, required by the Bay Area Air Quality Management District, shall be incorporated into the proposed project as construction specifications. These basic and enhanced control measures for construction emissions of fine particulate matter shall be implemented as necessary, depending on weather conditions:

L-1 Water all active construction sites at least twice daily, and more often on days when winds exceed 10 to 15 miles per hour.

L-2 Cover all trucks hauling soil, sand, and other loose materials *or* maintain at least 2 feet of freeboard in trucks hauling such materials.

L-3 Pave, apply water three times daily, or apply nontoxic soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.

L-4 Using water sweepers, sweep all paved access roads, parking areas, and staging areas at construction sites on a daily basis.

L-5 Using water sweepers, sweep streets adjacent to construction sites daily if visible soil material is carried onto adjacent public streets.

For construction areas involving disturbance of more than four acres, the following enhanced control measures shall be implemented:

L-6 Hydroseed or apply nontoxic soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more).

L-7 Enclose, cover, water twice daily, or apply nontoxic soil binders to exposed stockpiles (dirt, sand, etc.).

L-8 Limit traffic speeds on unpaved roads to 15 miles per hour.

L-9 Install sandbags or other erosion control measures to prevent silt runoff to public roadways.

L-10 Replant vegetation in disturbed areas as quickly as possible.

Implementation of Mitigation Measures L-1 to L-10 would reduce air quality impacts during construction to a less than significant level.

M. UTILITIES AND PUBLIC SERVICES

1.0 MITIGATION MEASURES IDENTIFIED IN THE INITIAL STUDY

The following measures shall be incorporated into the proposed project to reduce the potential for service disruptions during construction:

M-1 The SFPUC shall coordinate its planning and design efforts with other utilities. Affected utilities shall be consulted early in the process so that utility lines can be identified and avoided. If avoidance is not possible and relocation of any utilities is required, the SFPUC and the affected agency would mutually arrange for the movement of the facility prior to project construction.

M-2 To minimize delays in emergency response during project construction, all potentially affected police, fire protection, and ambulance services shall be notified in advance of the times, duration, and location of construction activities throughout the project's construction process. This measure shall be included in construction specifications.

Implementation of Mitigation Measures M-1 and M-2 would reduce service disruption impacts during construction to a less than significant level.

N. RECOMMENDED IMPROVEMENT MEASURES

The following measures are recommended to reduce adverse effects but are not required to reduce impacts to less than significant.

1.0 LAND USE

N-1 To minimize construction disruption to recreational uses in the vicinity of the Pulgas site, the SFPUC could post signs at the Pulgas Water Temple entrance six to eight weeks prior to construction to alert motorists, bicyclists, pedestrians, and equestrians of the proposed construction schedule. Such signage would divert recreational users from the construction site and could provide alternate pathways for recreational users. See also Improvement Measure N-8, below.

N-2 To minimize construction disruption to recreational uses in the vicinity of the Pulgas site, the SFPUC could require contractors to screen the construction site and equipment on weekends and store equipment so that it is not visible from the Pulgas Water Temple. Contractors could locate staging areas behind trees or other existing vegetation or in depressed areas not visible from Cañada Road. This would also reduce visual impacts at the Pulgas site during construction.

N-3 Six to eight weeks prior to construction, the SFPUC could notify Skyline Stables and equestrian groups that use the Harry W. Tracy WTP site of the proposed construction schedule and construction locations in order to avoid potential conflicts and safety hazards during construction.

2.0 PUBLIC HEALTH AND WATER SUPPLY

N-4 The SFPUC could provide coordination and education to assist the BAWUA agencies to prepare for the conversion, through the BAWUA Water Quality Committee meetings and workshops on chloramine conversion.

N-5 Individual BAWUA member agencies could conduct a comprehensive evaluation of their individual systems to determine the physical and/or operational modifications needed to maintain compliance with state and federal drinking water standards following chloramine conversion of the SFPUC water supply system. In particular, BAWUA member agencies that rely on a combination of SFPUC water and other source waters could evaluate and adjust for potential microbial regrowth and taste and odor concerns associated with mixing chloraminated water with other water sources. BAWUA member agencies should be prepared to implement recommended modifications to their systems prior to chloramine conversion.

3.0 AESTHETICS

N-6 At the San Antonio Pump Station and Pulgas sites, lighting could be directed downward to minimize glare. Lighting installed should be the minimum necessary for security and operations. Safety lighting should be installed at entry gates, access roads, and parking areas, and energy-efficient, low-wattage light fixtures are recommended. The SFPUC should consider using fixtures with timers or separate switches to minimize lighting requirements.

4.0 TRANSPORTATION

N-7 The SFPUC could require the contractor(s) to prepare a traffic control and access plan, in accordance with professional traffic engineering standards, to provide specific methods for maintaining traffic flow and ensuring safety for vehicular, pedestrian, and bicycle circulation in the vicinity of the Pulgas construction site. As deemed necessary, construction flaggers and/or other appropriate traffic control should be employed to safely guide the construction trucks and/or public vehicles in and out of the Pulgas site during periods when the temple is open to the public.

N-8 In addition to Improvement Measure N-1 regarding signage, the SFPUC could work with its ranger staff and the San Mateo County Parks and Recreation Department to provide appropriate information to the public to increase awareness of the proposed construction schedule.

N-9 During operation of the proposed project, potential emergency chemical deliveries to the Pulgas Water Temple coinciding with the County's "Bike Sunday" program could be coordinated with the San Mateo County Parks and Recreation Department staff, if feasible. Coordination and notification with the Parks Department would ensure that County staff patrolling this segment of Cañada Road during Bike Sunday could facilitate safe movement of trucks with pedestrians and bicyclists.

5.0 NOISE

N-10 At the Pulgas site, construction contractors could use best available noise control techniques (e.g., improved mufflers, equipment redesign, use of silencers, shields, shrouds, ducts, and engine enclosures) on construction equipment and trucks to help minimize construction-related noise increases.

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CHAPTER VI

OTHER TOPICS REQUIRED BY CEQA

A. GROWTH INDUCEMENT

Implementation of the proposed project would not result in growth-inducing effects. The project would not generate substantial new population growth, since proposed changes would not expand the capacity of the San Francisco Public Utilities Commission (SFPUC) water system. The purpose of the project is to improve the reliability of the SFPUC drinking water supply system to meet federal water quality requirements. While the project would result in changes to the treatment and circulation of the water distribution system, there would be no increase in the capacity and no expansion of the SFPUC water system throughout its service area. In addition, the project would require the construction of new facilities, including structures, pipelines, and access roads. All of these improvements are localized and directly related to the chloramination conversion process and would not induce growth or additional development.

Project implementation would not increase the demand for additional housing. For the initial operation and maintenance of the project, approximately 21 additional employees could be required throughout the SFPUC system, while long-term operation could require 6 new permanent employees. It is likely that many, if not all, of these employees would already reside in the Bay Area and would not create new or additional demand for housing in the region.

The project constitutes a continuation of an existing use. The proposed project would not alter surrounding land use patterns or encourage increased development in the vicinity of any of the four project facility locations (Tesla Portal, San Antonio Pump Station, Pulgas, and Harry W. Tracy Water Treatment Plant).

The project would include the construction of new chemical feed or contactor pipelines at proposed facilities. However, there would be no major off-site extension of water supply or distribution lines with additional capacity. Therefore, implementation of the project would not result in growth-inducing effects, either directly or indirectly.

B. SUMMARY OF CUMULATIVE ENVIRONMENTAL EFFECTS

California Environmental Quality Act (CEQA) Section 15130 requires environmental impact reports (EIRs) to discuss the cumulative impacts of a project when the project's incremental effects are "cumulatively considerable," that is, such effects are considerable when viewed in combination with the effects of past, current, and probable future projects.

1.0 RELATED PROJECTS AND PLANS

- The EIR examines related projects that could result in cumulatively considerable environmental effects. Generally, development projects in the vicinity of the project locations would be within SFPUC-owned lands. This section describes SFPUC Capital Improvement Program (CIP) projects that are planned or proposed in the vicinity of one or more of the proposed project locations. This section also presents a discussion of SFPUC watershed management plans and other SFPUC systemwide projects that may pertain to the planning or design of the proposed project. The related projects and plans, shown in Figure VI-1, are considered in the analysis of potential cumulative impacts and described below.

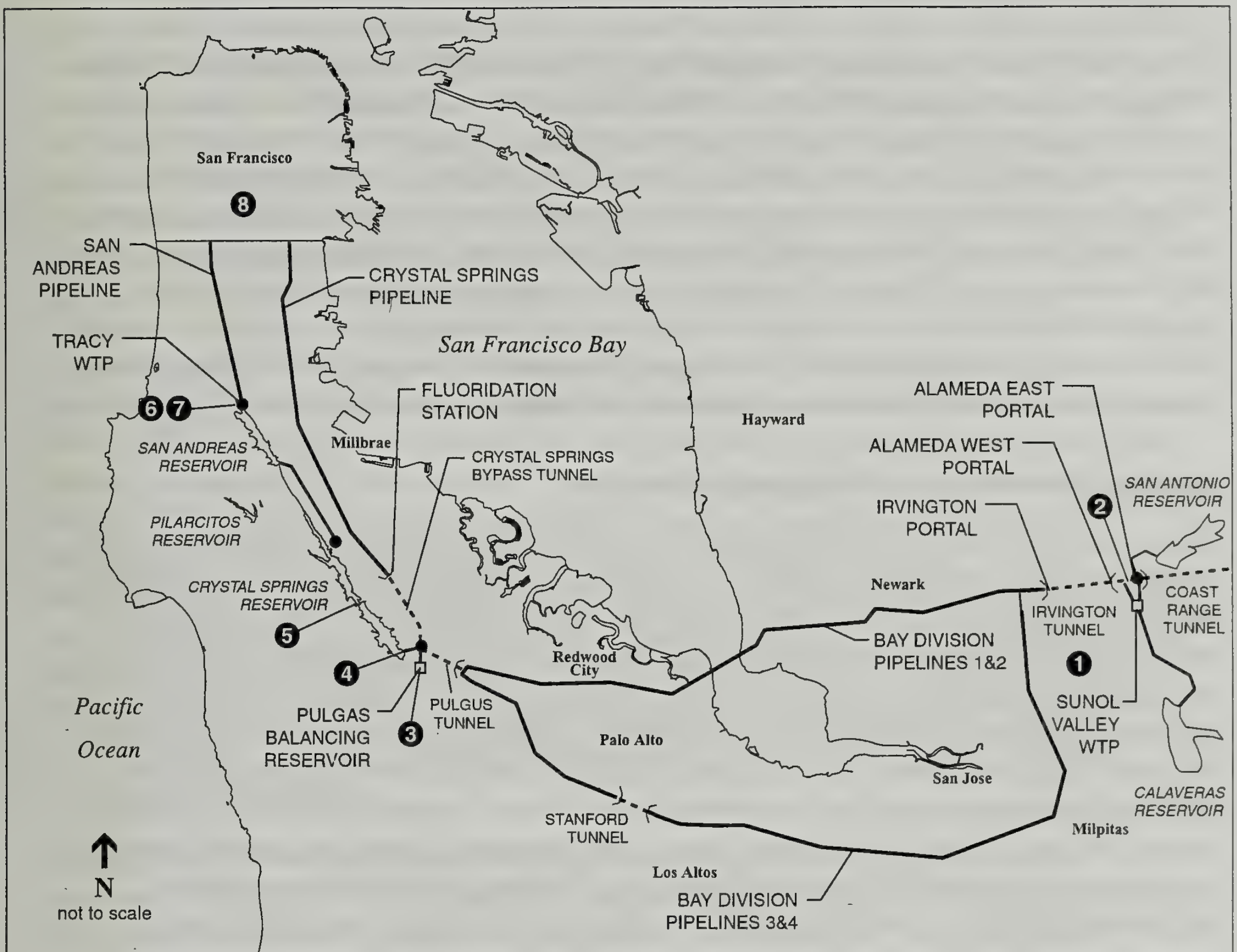
These SFPUC projects and plans are distinct from the proposed project due to the separate project objectives and design processes, and are undergoing separate environmental reviews, as determined necessary by the San Francisco Planning Department. In accordance with CEQA, these related projects and plans are considered in this EIR due to the potential for cumulative environmental effects to occur, either during construction or in terms of long-term impacts to environmental resources. These projects could be under construction at the same time, or immediately preceding or following, the proposed project. If construction coincides with the proposed project, cumulative construction-related impacts could occur in the vicinity of the Pulgas site, Harry W. Tracy Water Treatment Plant (WTP) site, and the Sunol Valley area. Implementation of Phase 2 System Controls and Data Acquisition projects and City Distribution Division (CDD) projects in conjunction with the proposed Chloramine Conversion project could contribute to cumulative operational impacts. At this time, there are no projects or studies in the vicinity of the Tesla Portal project area that are planned and funded or that have construction schedules that coincide with the proposed project.

1.1 SUNOL VALLEY VICINITY

Sunol Valley Water Treatment Plant Improvement Project

The Sunol Valley WTP Improvement Project consists of two phases. Phase 1 involves improvements required to increase the reliability of plant operations and to achieve compliance with California Department of Health Services Compliance Order No. 02-04-96C-001. The purpose of Phase 2 is to develop a future facilities plan for the Sunol Valley to accommodate increasing water demand and to assure reliability and redundancy of the SFPUC's transmission system.

Phase 1 includes improvements to the following treatment processes at the Sunol Valley WTP: flow distribution/flash mix, flocculation, sedimentation, filtration, chemical feed systems, residuals handling, plant drainage, electrical instrumentation and controls, seismic upgrades, and functional upgrades. The SFPUC proposes to restore the Sunol Valley WTP's capacity to 160 million gallons per day (mgd) by installing plate settlers in the sedimentation basin. All the Phase 1 improvements are within the plant footprint and are scheduled to begin construction in the summer of 2000, with completion by mid-2002. The San Francisco Planning Department has determined that Phase 1 is categorically exempt from CEQA. A 40-million-gallon treated water



1 Sunol Valley WTP Improvement Project
2 Alameda Creek Fishery Enhancement Project
3 Pulgas Balancing Reservoir Improvements
4 Pulgas Dechlorination Facility
5 Lower Crystal Springs Dam Abutment Protection Project
6 Harry W. Tracy WTP Improvement Project
7 Harry W. Tracy WTP Plant Residuals Project
8 CDD Improvement Projects

System Projects (not shown)
SCADA Projects
Alameda Watershed Management Plan
Peninsula Watershed Management Plan

SOURCE: Montgomery Watson, 1993; SFPUC, 2000

1998.898E: Hetch Hetchy Water Treatment Project-Chloramine Conversion / 990095

Figure VI-1
Location of Related Projects

demand of 440 mgd through the Sunol Valley in 2010 and a restored reservoir is proposed for construction at the Sunol Valley WTP as soon as funds are available and would be subject to CEQA environmental review.

Phase 2 was developed based on demand projections from the SFPUC *Water Supply Master Plan*. Based on a projected peak-month Sunol Valley WTP capacity of 160 mgd, Phase 2 recommends constructing a new 280-mgd direct filtration treatment plant at the Alameda West Portal. The preliminary project also includes a new pump station, transmission and distribution pipelines, and a 60-million-gallon treated water reservoir at the Alameda West Portal site. The new Alameda West Portal plant would be constructed in modules, with the first module (240 mgd) to come on line no sooner than 2010. Phase 2 is currently in the conceptual planning phase and would require CEQA environmental review prior to approval and implementation. Construction would not begin until 2007 at the earliest. This project is considered in the cumulative analysis due the potential combined effects on resources in the vicinity of the Alameda West Portal.

Alameda Creek Fishery Enhancement Project

This project would provide for the release of water from the Calaveras Dam to Alameda Creek to enhance native riparian and fish habitat. The project includes the installation of an impoundment structure to enhance fish habitat, and a water recapture system to return the water to the SFPUC reservoir. The scope of work includes a fish release structure, a small recovering impoundment structure, a pump station to transport recovered water, and a pipeline from the impoundment structure to the terminal reservoirs. The impoundment would be located on Alameda Creek, near the Sunol Valley WTP, about one mile upstream of the San Antonio Pump Station, and would consist of an inflatable rubber dam to maintain a pool of water. A small pump station would be constructed near the impoundment site. Water would be pumped from the impoundment through a new pipeline that would run parallel to the existing Calaveras Pipeline and intercept the San Antonio Pipeline near the San Antonio Pump Station. This project would allow water released into Alameda Creek to be recaptured, pumped to, and stored in San Antonio Reservoir for future use by the SFPUC.

An environmental impact report is under preparation and project details are still being defined. Construction is planned to start in April 2002 and would be completed in December 2002. This project is considered in the cumulative analysis due the potential combined effects on Alameda Creek resources, since restoration efforts under this project could affect future fish populations, including steelhead.

1.2 PULGAS SITE VICINITY

Pulgas Dechlorination Facility Project

The Pulgas Dechlorination Facility Project consists of dechlorination facilities to remove chlorine from current discharges of drinking water to Upper Crystal Springs Reservoir. Chlorine removal is required to comply with discharge limitations of the *Water Quality Control Plan of the San Francisco Bay Basin* (Basin Plan) under the jurisdiction of the California Regional Water Quality

Control Board (RWQCB). The Basin Plan prohibits discharge of chlorine (or other pollutants harmful to aquatic systems) into reservoirs, creeks, or other surface waters. The project would involve development of dechlorination facilities at two locations: (1) an undeveloped area approximately 300 feet southwest of the Pulgas Water Temple, and (2) a paved area about 60 feet northwest of the Pulgas Balancing Reservoir. The two facilities would provide sodium bisulfite receiving, storage, and injection facilities and associated pipelines for treating discharges through the Pulgas Temple Overflow Channel and overflows from the Pulgas Balancing Reservoir, respectively. The project would include a metering pump building, emergency generator, widening/improvement of a gravel roadway, domestic water pipeline, parking lot paving, propane tank, gas supply line, landscaping, and various other minor improvements in the site vicinity. The dechlorination facility would be capable of automatic as well as manual operation.

Since this facility is being proposed to ensure compliance with RWQCB Basin Plan requirements, project design and construction are scheduled for completion prior to construction of the the Chloramine Conversion project's proposed dechloramination facility (removal of both chlorine and ammonia) at the Pulgas site. The Pulgas Dechlorination Facility (removal of chlorine only) is planned to operate for one to four years, until the proposed Chloramine Conversion project's Pulgas dechloramination facility is designed, constructed, and fully operational. The dechloramination facility would ultimately include facilities to remove chlorine from discharges to Crystal Springs Reservoir and would replace this facility. Following approval and implementation of the Chloramine Conversion project, the proposed Pulgas Dechlorination Facility would serve as a back up to the dechloramination facility for at least one year and possibly longer. At that time, the SFPUC would decide whether to maintain it as a backup system or to decommission it.

Assuming the dechlorination project were funded by October 2000, the project would be completed by late 2001. If this project were not implemented, chlorinated discharges into Crystal Springs Reservoir would continue until completion of the Chloramine Conversion project's dechloramination facility, and the Chloramine Conversion project would incorporate the Dechlorination Facility at the Pulgas Balancing Reservoir. The Pulgas Dechlorination Project is currently undergoing environmental review, and a Negative Declaration is scheduled to be completed by mid-2000. This project is considered in the cumulative analysis due to the potential overlap in construction schedules as well as potential combined effects on biological resources in the Pulgas vicinity.

Pulgas Balancing Reservoir Improvements

The objective of this ongoing CIP project for Water Quality Compliance Improvements is to identify and implement improvements to the SFPUC drinking water transmission system and treatment facilities in order to meet new water quality regulations, to improve water quality and service for customer satisfaction, to provide reliability in treatment and transmission facilities, and to optimize treatment system performance. This project would first assess potential needs for reservoir improvements in the future. While the Chloramine Conversion project may include operational and internal physical changes to improve mixing, the Balancing Reservoir Improvements Project would involve any additional changes that are deemed necessary to

improve water quality, such as roof and wall repairs, pipeline modifications, mixing element installation, and other structural and mechanical improvements. In 2003/2004, construction of new physical and/or mechanical mixing improvements may be implemented, if studies show that definite water quality benefits would result. This project is considered in the cumulative analysis due the potential combined effects on resources in the vicinity of the Pulgas Balancing Reservoir.

Lower Crystal Springs Dam Abutment Protection Project

The State Division of Safety of Dams has determined that the Lower Crystal Springs Dam will not be able to safely withstand the probable maximum flood and has directed the City of San Francisco to make various improvements to the dam. The State Division of Safety of Dams has indicated that an uncontrolled spill could occur from Crystal Springs Dam if an earthquake occurred during the probable maximum flood, leading to possible collapse of the Cañada Road bridge (owned by San Mateo County), which is located on top of the dam, and destruction of the stoplogs. The subsequent uncontrolled release of water during the probable maximum flood could undermine the abutments downstream of the dam, if they are not adequately armored. Until such improvements are made, the State Division of Safety of Dams has placed operational restrictions on the dam. Under this project, various improvements to the dam would be made so that it can withstand the probable maximum flood. Proposed improvements include raising the parapet wall, constructing a stilling basin downstream, and installing gates in the spillway. The Lower Crystal Springs Dam Abutment Protection Project could restore the former capacity of the Crystal Springs Reservoir, and the SFPUC is researching historical operating conditions and levels of the reservoir.

The project is being coordinated with San Mateo County, which is in the process of planning and designing replacement of the bridge located on top of the dam. The bridge replacement project is currently undergoing the environmental review and engineering design phase. Environmental review for the Lower Crystal Springs Dam Abutment Protection Project is scheduled for completion by the end of 2001; design would start in late 2001, and construction would begin in May 2002. Construction should last 11 months, with completion in mid-2003.

Background studies prepared for this project have identified two endangered species (San Francisco garter snake and California red-legged frog) that would be affected by the project. The studies called for ongoing special-status species monitoring. This project is considered in the cumulative analysis due the potential combined effects on biological resources in the Pulgas area.

1.3 HARRY W. TRACY WATER TREATMENT PLANT VICINITY

Harry W. Tracy Water Treatment Plant Residuals Project

The project is designed to comply with an order from the RWQCB to abate residual solids from filter backwash water at the WTP that is discharged into the San Andreas Reservoir. The project would achieve this objective by removing residual solids from backwash water before discharging the clarified water to the reservoir.

Two 120-foot-diameter, 1.23-million-gallon capacity tanks would be constructed to remove the residuals by clarification. The inert, nonhazardous settled residuals would be transferred from the clarifiers by pipe to a 30-foot-diameter, 100,000-gallon storage tank. The residuals would be transported by tanker truck to the City of San Francisco's Oceanside Water Pollution Control Plant (WPCP) for processing with solids from the WPCP. The clarified washwater would be released to the San Andreas Reservoir.

The project would consist of construction of tanks and an associated service road; installation of buried and aboveground piping to facilitate movement of backwash water, settled residuals, and clarified water; discharge of clarified water to San Andreas Reservoir; up to three truck trips per day to haul the thickened residuals to Oceanside WPCP; and landscaping of the site to replace removed vegetation and provide visual screening.

Construction is planned to begin in the fall of 2000 and would be completed by mid-2001. A Negative Declaration will be published in mid-2000. This project is considered in the cumulative analysis due the potential overlap in construction schedules at different sites within the Harry W. Tracy WTP site.

Harry W. Tracy Water Treatment Plant Short-Term Improvement Project

A number of plant deficiencies identified at the Harry W. Tracy WTP have restricted plant operation at rates close to the maximum capacity. The purpose of this CIP project is to complete improvements required for the Harry W. Tracy WTP to reliably operate at flows greater than 120 mgd for extended periods of time. The project would include improvements to the filtration, coagulation, and flocculation processes. Minor upgrades would also be made to the ozone cooling system and the plant effluent flow-monitoring capabilities. The filtration process improvements are scheduled for construction from 2002 through 2004. Improvements to the coagulation and flocculation processes are scheduled to occur during 2002 and 2003. This project is considered in the cumulative analysis due the potential overlap in construction schedules at different sites within the Harry W. Tracy WTP site.

1.4 SFPUC SYSTEMWIDE IMPROVEMENT PROJECTS

Phase 2 System Controls and Data Acquisition Projects

The System Controls and Data Acquisition (SCADA) is a control system that would monitor the City of San Francisco's entire water transmission and distribution system, from the impounding reservoirs in the Sierra, through the East Bay and Peninsula, and into the City. This project involves the installation of a remote telemetry and control system and is geographically dispersed throughout the SFPUC water system. It would ultimately result in 300 SCADA sites. The work at each site includes installing interior and exterior control panels, equipment vaults, and local drainage systems and providing satellite communications equipment, including 48-inch roof-and pole-mounted satellite dishes. This group of SCADA projects was determined to be categorically exempt from CEQA in 1998. The project would be implemented in three phases. Phase 1 is scheduled for completion in July 2001. The second SCADA phase would cover 100 sites.

Construction of Phase 2 is scheduled to begin January 2002, with completion to occur by November 2003. Construction of the subsequent phase is scheduled for a two-year period beginning in December 2003. Projects identified for initial implementation include Alameda East Portal, Alameda West Portal, San Antonio Pump Station, Tesla Portal, Pulgas Pump Station, and Harry W. Tracy WTP. This project is considered in the cumulative analysis due the potential combined effects on resources at proposed project locations.

1.5 CITY DISTRIBUTION DIVISION IMPROVEMENT PROJECTS

The SFPUC's CDD system includes 10 reservoirs, 7 tanks, 18 pumping stations, and a network of more than 1,000 miles of pipelines within the City and County of San Francisco. The treated water reservoirs and storage tanks range in capacity from 75,000 gallons to 88 million gallons. Many of the facilities are over 50 years old, and some pipelines and reservoirs are over 100 years old. The CDD has developed a CIP to upgrade the facilities to meet requirements for public safety, facility access and security, and overall regulatory compliance. The types of improvement projects under the CDD CIP include reservoir and tank improvements, pump station improvements, pipeline improvements, water quality improvements, and administrative projects.

Water quality improvements are ongoing projects to upgrade the treatment and sampling stations throughout the distribution system. The project would include improvements needed at 12 chlorine stations in the City. The design and construction phases of the chlorine station upgrades are scheduled to occur between 1999 and 2001. Implementation of these improvements would reduce the potential for nitrification associated with chloramine conversion, would improve water quality, and would increase the reliability of the distribution system.

A typical CDD project under this CIP program would address pump stations, pipelines, and reservoirs. For a pump station, improvements could include electrical systems, mechanical systems, access, chlorination facility, SCADA, emergency power systems, and upgrades to meet seismic codes. Pipeline replacements would be required to increase carrying capacity, pressure, and system reliability. Reservoir improvements could include concrete repair, expansion joint repair, new inlet vaults, or improvements relating to erosion, drainage, security, seismic, and cleaning. Construction activities for a typical project could range from six months to two years. These improvement projects are considered in the cumulative analysis due the potential overlap in construction schedules at CDD facility sites.

1.6 WATERSHED MANAGEMENT PLANS

The draft *Alameda Watershed Management Plan* and the draft *Peninsula Watershed Management Plan* (referred to as "the Plans") provide a policy framework regarding activities, practices, and procedures that are appropriate on SFPUC watershed lands. To aid the SFPUC in its decision-making, the Plans would provide a comprehensive set of goals, policies, and management actions that integrate all watershed resources and reflect the unique qualities of the watersheds.

In addition to serving as a long-term policy framework for decision-making by the SFPUC, the Plans are also intended to be used as watershed management implementation guides by the

SFPUC's Land and Resource Management Section (LRMS) staff. The Plans would provide the LRMS manager and staff with management actions designed to implement the established goals and policies for water quality, water supply, ecological and cultural resource protection, fire and safety management, watershed activities, public awareness, and revenue enhancement.

Although the Plans do not include any specific facility or construction projects in the vicinity of the proposed project locations, the San Antonio Pump Station, Alameda East Portal, and Alameda West Portal sites are included in the *Alameda Watershed Management Plan* area, and the Pulgas and Pulgas Balancing Reservoir sites are included in the *Peninsula Watershed Management Plan* area. The Plans are undergoing environmental review, which is scheduled for completion by summer 2000. Following the completion of the environmental review process, the Plans may be approved and implemented; they are designed to be implemented over a 20-year period. These Plans are considered in the cumulative analysis due to the potential overlap in construction schedules at different sites within the two watersheds and due to the need to consider the consistency of the proposed project with any applicable goals, policies, or management actions contained in the Plans.

2.0 CUMULATIVE ENVIRONMENTAL EFFECTS

2.1 SUNOL VALLEY VICINITY

As described in Section IV.B, the proposed improvements at the San Antonio Pump Station, Alameda East Portal, and Alameda West Portal sites would not result in significant, unavoidable impacts; all identified impacts could be mitigated to a less than significant level. Implementation of other planned or proposed projects in the Sunol Valley, including the Sunol Valley WTP Improvement Project Phase 2, Alameda Creek Fishery Enhancement Project, and *Alameda Watershed Management Plan* is still subject to environmental review; these projects are either beginning the environmental review process or are awaiting future environmental review, and there has been no determination of potential impacts associated with those projects. However, since the area is known habitat for sensitive species, including the California red-legged frog and California tiger salamander, the projects in the Sunol Valley area could have individual or cumulative impacts on sensitive species that would be determined when environmental review of all related projects is completed. Nevertheless, the proposed Chloramine Conversion project would not have any unavoidable impacts on special-status species. Therefore, even if cumulative impacts from the other projects are identified in the future, the Chloramine Conversion project's contribution would not be cumulatively considerable.

Cumulative construction-related increases in traffic and noise would not be anticipated, since construction at the three project facility sites is not currently expected to coincide with construction of the Sunol Valley WTP Improvement Project Phase 2 or implementation of construction projects under the *Alameda Watershed Management Plan*. Although two alternative sites under consideration in the Sunol Valley WTP Improvement Project Phase 2 Future Facilities Plan include the Alameda East and West Portal sites, no cumulative construction-related impacts would be anticipated since construction of Phase 2 facilities would not begin until 2007 at the earliest.

2.2 PULGAS SITE VICINITY

There are four projects or plans proposed in the Pulgas site vicinity that could cumulatively contribute to environmental effects on various resources: Pulgas Dechlorination Facility project, Pulgas Balancing Reservoir Improvements, Lower Crystal Springs Dam Abutment Protection Project, and the *Peninsula Watershed Management Plan.*

With respect to biological resources, the two principal species of concern in the Pulgas site vicinity are the San Francisco garter snake and California red-legged frog, both federally listed species. Other sensitive plants and wildlife occur throughout the general project region; however, cumulative effects from the above-mentioned projects and plans are anticipated only for San Francisco garter snake and California red-legged frog. Biological assessments at the four project sites are summarized in Table VI-1.

The proposed Chloramine Conversion project, Pulgas Dechlorination Facility project, and the Lower Crystal Springs Dam Abutment Protection Project could all contribute to the cumulative loss of the San Francisco garter snake or California red-legged frog and to degradation of suitable habitat. The U.S. Fish and Wildlife Service is participating in the review of proposed activities in the areas surrounding the Pulgas site and the Lower Crystal Springs Dam, and may choose to address potential cumulative habitat impacts and species losses through the formal consultation process under the Federal Endangered Species Act. The proposed dechloramination facility would be located within upland grasslands habitat, sufficiently distanced from occupied breeding habitat for these species, and thus would not be expected to cumulatively contribute to the decline of either species. However, construction of the diversion pipeline for the proposed project would cause a temporary disturbance within riparian habitats associated with the seasonal waterway located north of this site and could affect the San Francisco garter snake or California red-legged frog. Species mortality and the loss of significant breeding or upland habitat, however, are not expected. Disturbed areas are expected to revegetate rapidly and would not result in significant, long-term habitat losses. Although the proposed project's temporary impacts would contribute incrementally to cumulative impacts on these species, the project's contribution to this cumulative impact would be reduced to a less than significant level by biological mitigation measures listed in Section V.C.

Other potential cumulative impacts would involve cumulative increases in construction traffic and noise as well as disruption of recreational uses in the Pulgas site vicinity during construction. Construction of the above-mentioned projects in conjunction with the proposed project would extend the length of time that additional truck traffic would occur on local roadways, that increased noise levels would occur due to operation of construction equipment, and that recreational uses in the temple vicinity could be disrupted. Cumulative increases in truck traffic would not be expected to create new traffic safety problems, assuming trucks would access Cañada Road as is proposed for this project, and that traffic safety measures implemented during project construction were implemented for the other projects as well. While construction noise levels could increase if construction of these projects coincided, the large distances to the nearest

TABLE VI-1
BIOLOGICAL ASSESSMENT OF RELATED PROJECTS IN THE PULGAS AREA

Related Project	Biological Assessment
Pulgas Dechlorination Facility	This project is proposed in an ornamental oak (cork oak) woodland orchard that may provide upland habitat for the San Francisco garter snake and California red-legged frog. This project site is not considered to provide optimal upland habitat for either species. Based upon the proximity of the proposed facilities to known wetland breeding habitat, construction could contribute to habitat loss for one or both species. A primary concern is the proximity of the proposed facility to known and suspected occupied willow riparian habitat, which occurs roughly 100 feet west of this site.
Pulgas Balancing Reservoir Improvements	This project would not affect habitat for either species. The reservoir is not in a sensitive location, and the working area for this project is paved. Improvements would be internal (i.e., inside the existing reservoir structure) and would require minimal or no excavation. The equipment staging areas for these improvements are paved.
Lower Crystal Springs Dam Abutment Protection Project	This project is currently undergoing project definition to determine historical operating conditions, expected operating scenarios, and baseline conditions for environmental review. Special studies have been identified to address potential impacts on the San Francisco garter snake and California red-legged frog, based on worst-case scenario projections of project conditions. Large earthmoving equipment access would be required for the proposed improvements, and proposed activities could directly or indirectly impact habitat for either listed species. Significant habitat losses for the San Francisco garter snake and California red-legged frog are not anticipated as a result of the dam abutment project, but would be reviewed in conjunction with other nearby projects if significant environmental effects were identified. Potential direct impacts include the loss of aquatic habitat, including dense willow habitat that occurs in lowlands throughout the region, a loss of individual listed species, and the potential for indirect sedimentation impacts as a result of unstable soil movement following construction. The severity of the impacts would depend on the evaluation of the baseline and operational criteria. Any significant habitat loss would have to be mitigated through the re-creation of off-stream wetland habitat not affected by reservoir fluctuations. Several sites have been proposed, and one major site is the habitat near the temple below the sedimentation basin, part of which may be rehabilitated as part of the proposed Chloramine Conversion project.
Peninsula Watershed Management Plan	This plan sets forth a long-term strategy for protecting and preserving sensitive wetland and biological resources in the watershed. As such, this plan does not compromise the continued existence of either the San Francisco garter snake and California red-legged frog in the project area.

sensitive noise receptors would reduce the potential for significant noise impacts. Project-related traffic and noise increases would be well below significance threshold levels, and cumulative increases in construction traffic and noise are similarly not expected to exceed threshold levels. Direct impacts on public access to the temple would be temporary and limited to the pipeline portions of the proposed project and the Pulgas Dechlorination Facility only, and there would be no significant, unavoidable impacts. Therefore, no significant, cumulative, construction-related impacts are expected to result from construction of the proposed project in conjunction with the other improvement projects.

2.3 HARRY W. TRACY WATER TREATMENT PLANT VICINITY

Development of proposed facilities at the Harry W. Tracy WTP in conjunction with the Harry W. Tracy WTP Residuals Project and Short-Term Improvement Project could result in cumulative increases in construction-related traffic and noise. Noise from construction trucks could be temporarily annoying and disruptive to residences along the truck routes, and depending on the construction schedule of the three projects, there could be an extended period of disruption to the residences in the vicinity of the WTP. Based on the types of facility improvements associated with the proposed project and the Residuals and Short-Term Improvement Projects, traffic and noise increases are not expected to be significant. All of the projects would generally involve construction within the developed portion of the WTP boundaries, so none of the projects are expected to require extensive excavation or concrete placement as part of structural improvements, which are the types of activities that typically result in noticeable increases in traffic and noise. Therefore, cumulative increases in traffic on Crystal Springs Road would be less than significant, due to the short-term nature of these construction projects and the small amounts of traffic anticipated during construction. Cumulative increases in construction noise would similarly be less than significant due to the short-term nature of these construction projects and large setbacks between facilities and the nearest noise-sensitive receptors (500 to 1,000 feet).

2.4 SFPUC SYSTEMWIDE IMPROVEMENT PROJECTS

Implementation of the Phase 2 System Controls and Data Acquisition projects and CDD CIP projects in conjunction with the proposed project could contribute to cumulative operational impacts. Although the locations and timing of these projects vary, no systemwide cumulative construction impacts would be anticipated. While implementation of these projects would improve systemwide water quality, implementation of CDD projects, combined with modifications associated with chloramine conversion, could lengthen construction periods at individual reservoirs, if additional improvements to increase mixing at CDD reservoirs were found to be needed after completion of both projects. Control measures implemented as part of the CDD projects to reduce construction-related impacts at individual reservoirs would be adequate to mitigate these cumulative, construction-related impacts.

C. SIGNIFICANT, UNAVOIDABLE ENVIRONMENTAL EFFECTS

In accordance with Section 21067 of CEQA and with Sections 15040, 15081, and 15082 of the CEQA Guidelines, the purpose of this section is to identify impacts that could not be eliminated or reduced to an insignificant level by mitigation measures included as part of the project, or by other mitigation measures that could be implemented, as described in Chapter V, Mitigation Measures.

● This chapter was subject to final determination by the San Francisco Planning Commission as part of its certification process for the EIR.

For the proposed Hetch Hetchy Water Treatment Project--Chloramine Conversion, potential impacts of project implementation have been evaluated at program and project levels, depending on the availability of design information. Project-level analysis was completed for proposed new facilities at the following sites: Tesla Portal, San Antonio Pump Station, Alameda East and Alameda West Portals, Pulgas site, Pulgas Balancing Reservoir, and Harry W. Tracy WTP. Potentially significant impacts associated with these proposed facilities would be reduced to a less than significant level with implementation of mitigation measures listed in Chapter V, Mitigation Measures. Therefore, no significant, unavoidable impacts would occur as a result of project implementation.

For other project components where site-specific engineering and design information is not yet available, potential impacts have been evaluated at a program level in this EIR. Such components include: (1) dechlorination facilities at secondary discharge locations; (2) modifications to the CDD system; and (3) modifications to Bay Area Water Users Association member agencies' facilities. For these project components, all potential significant impacts would be reduced to a less than significant level with implementation of mitigation measures listed in Chapter V, Mitigation Measures. Based on the information available to date, no significant, unavoidable impacts would result from implementation of program-level project components. Depending on site-specific design and siting conditions, some aspects of these project components could require additional environmental review when site-specific information becomes available.

D. SIGNIFICANT, IRREVERSIBLE ENVIRONMENTAL CHANGES

CEQA Section 15126.2(c) states that impacts associated with project development may be considered significant and irreversible if:

- The project would involve a large commitment of nonrenewable resources.
- The primary and secondary impacts of a project would generally commit future generations to similar uses (such as a highway improvement that provides access to a previously inaccessible area).
- The project involves uses in which irreversible damage could result from potential environmental accidents associated with the project.

Project construction and operational impacts would result in an irretrievable and irreversible commitment of natural resources through construction-related consumption of fossil fuels and use of materials. Operation of project facilities would incrementally increase power consumption associated with Hetch Hetchy water treatment facilities at all project sites. Project facilities would also result in an irreversible, long-term commitment of land to accommodate proposed facilities. However, substantial commitments of resources have already been made for treatment of the Hetch Hetchy water supply, and the project's incremental, long-term commitments would not significantly increase the overall commitment of resources associated with water treatment.

The project would have limited potential for accidents that could cause irreversible damage. The proposed project would increase chemical storage at the Tesla Portal, San Antonio Pump Station, Alameda East Portal, and Harry W. Tracy WTP sites and would introduce chemical storage at the Alameda West Portal and Pulgas sites. Design provisions for chemical loading and storage areas and compliance with hazardous materials regulations would provide a high level of public health protection, limiting the potential for accidental discharges into the environment. Uncontrolled releases of chlorinated or chloraminated water would also be mitigated to a less than significant level due to provisions for permanent or portable dechlorination facilities. The project proposes to construct permanent dechlorination facilities for all uncontrolled release sites where volumes typically exceeded 1 gallon per minute. Therefore, under normal operating conditions, the project would not increase the potential for environmental accidents and, in some cases (such as at the Tesla Portal and Alameda East Portal sites), there would be improved safety conditions compared to existing conditions. However, in the event of a system upset at the Pulgas Dechloramination Facility, there is the potential for highly chlorinated water to be discharged to Upper Crystal Springs Reservoir, which would be extremely toxic to fish and other aquatic life; redundant design elements would be included in the project to minimize the possibility of this type of failure.

Thus, since the project would involve an incrementally minor use of nonrenewable resources, would locate facilities on lands already committed for water supply purposes, and would provide a high level of public health protection against environmental accidents, the project would not result in significant and irreversible environmental changes.

CHAPTER VII
ALTERNATIVES

A. INTRODUCTION

This chapter discusses the following alternatives and their associated environmental impacts:

- No Project Alternative
- Disinfection Alternatives
- Chloramination Alternatives
- Facility Siting and Design Alternatives
- Other Alternatives Considered

California Environmental Quality Act (CEQA) Section 15126.6(a) requires environmental impact reports (EIRs) to "describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project, but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives." The purpose of the Hetch Hetchy Water Treatment Project--Chloramine Conversion is to improve the reliability of the San Francisco Public Utilities Commission (SFPUC) drinking water supply system to meet water quality requirements of the federal Stage 1 Disinfectants and Disinfection By-Products (D/DBP) Rule, promulgated in 1998. In addition, an ancillary project objective is to comply with the State Water Code, which prohibits discharge of chlorine or other substances that are toxic to aquatic organisms into reservoirs, creeks, or other "waters of the state."

As discussed in Chapter II, Introduction and Background, the SFPUC has conducted extensive studies on the SFPUC water supply system related to improving reliability to meet the D/DBP Rule and other recent and anticipated water quality regulations. These studies identified and evaluated a comprehensive range of alternative treatment or disinfection methods and facilities needed for improvements related to disinfection, corrosion control, ozonation, and filtration processes (San Francisco Water Team, 1996). Based on these studies, conversion to chloramine was determined to be the only disinfection method that could reliably meet the requirements of the Stage 1 D/DBP Rule and the anticipated Stage 2 Rule. Thus, the No Project Alternative as well as the other disinfection alternatives evaluated in the preliminary engineering report (discussed below) would not achieve the objectives of the proposed project. While project objectives could be met with chloramination alternatives as well as facility siting alternatives, these alternatives were determined to result in more physical impacts on the environment or more impacts on sensitive biological resources. Therefore, the proposed project was determined to be the environmentally preferred alternative. As discussed in Section VI.C, if mitigation measures suggested in Chapter V are adopted, no significant impacts from the project would occur.

B. NO PROJECT ALTERNATIVE

The purpose of the Hetch Hetchy Water Treatment Project--Chloramine Conversion is to improve the reliability of the SFPUC drinking water supply system to meet water quality requirements of the D/DBP Rule. Since the project objective is to meet this rule, and conversion to chloramine was determined to be the only treatment method that could reliably meet this rule, the No Project Alternative would not fulfill this objective.

The No Project Alternative consists of some form of "no action" or "status quo" of current water treatment processes. Disinfection of the SFPUC drinking water sources is currently provided by free chlorine applied in the form of sodium hypochlorite. This disinfection has historically met water quality requirements for pathogen inactivation; however, use of chlorine as a residual disinfectant results in the formation of low levels of halogenated compounds, known as disinfection by-products, some of which are suspected carcinogens. Therefore, current treatment processes would continue to generate low levels of halogenated compounds, which would not reliably comply with the Stage 1 Rule and may not comply with the anticipated Stage 2 Rule. Since the No Project Alternative would not result in compliance with this rule by the federally required implementation date, this alternative would not meet the project's objective.

Implementation of the No Project Alternative would avoid potentially significant impacts identified in Chapter IV, including impacts on biological resources at various facility sites; impacts on the visual character, biological resources, and cultural resources of the Pulgas site; impacts on dialysis patients, aquarium and pond owners, and sensitive users; and hazardous materials impacts at the San Antonio Pump Station site and the Harry W. Tracy Water Treatment Plant (WTP). In addition, the No Project Alternative would avoid construction-related impacts at all sites, particularly construction-related disruption to users in the vicinity of the Pulgas site.

C. DISINFECTION ALTERNATIVES

The SFPUC conducted water quality treatability studies with Hetch Hetchy water to evaluate alternative disinfection methods for controlling disinfection by-products (Camp Dresser & McKee, 1995). These studies included pilot-scale testing and examined three major disinfectant strategies: ozone, chlorine, and chloramine. The three disinfection methods were evaluated for primary and/or residual (secondary) disinfection and also considered the three disinfection methods under two conditions: Hetch Hetchy water with filtration and without filtration. The potential disinfection alternatives identified were: (1) free chlorine with or without filtration, followed by either chlorine or chloramine for residual disinfection; (2) ozone with or without filtration, followed by chlorine or chloramine for residual disinfection; and (3) chloramine for both primary and residual disinfection. Ozonation was not considered for residual disinfection because ozone is highly reactive and residual ozone decays. Investigations were conducted at various times from 1992 to 1993 to evaluate any seasonal variations.

The results indicated that in order to reliably comply with the Stage 1 and Stage 2 D/DBP Rules, use of chloramine for the residual disinfectant in combination with a primary disinfectant was the only acceptable method for lowering levels of disinfection by-products to meet regulatory

requirements. Chlorine was determined to be an effective primary disinfectant, but due to the long detention time in the transmission and distribution system, was determined to be unacceptable for residual disinfection due to the formation of disinfection by-products. Chloramine is a weaker disinfectant than either ozone or chlorine and was determined to be ineffective for primary disinfection but, because of its stability, effective for residual disinfection. Thus, the two remaining alternatives were: (1) chlorine followed by chloramine, and (2) ozone followed by chloramine. The overall water supply system, as described in Chapter II, Introduction and Background, uses free chlorine for primary disinfection, although ozonation as a primary disinfection method for Hetch Hetchy water is still under consideration for future projects. None of the alternative disinfection methods alone (without chloramination) would reliably meet the requirements of the D/DBP Rule. Therefore, use of chloramine as the residual disinfectant was identified for further engineering studies to determine specific facility needs, which led to the project as currently proposed. Because alternatives to chloramination were determined by these extensive studies to not meet the fundamental project objective, they have not been analyzed as alternatives in this EIR.

D. CHLORAMINATION ALTERNATIVES

The conceptual engineering study for the proposed project examined three chloramination alternatives that would achieve the water quality objectives of the proposed project by construction of required facilities at different locations along the water system. Facilities and locations associated with the three alternatives are listed in Table VII-1.

Due to the layout of the SFPUC water supply system, all three alternatives would require development of new facilities at the Tesla Portal, San Antonio Pump Station, Pulgas, and Harry W. Tracy WTP sites. Therefore, associated physical impacts resulting from facility development at these four sites would occur regardless of the alternative. Development of Chloramination Alternative 1 would require development at one additional site (Alameda West Portal). Chloramination Alternative 2 would require new facilities at four additional sites (Rock River, Modesto Irrigation District Connection, San Joaquin Valve House, and Sunol Valley WTP), while Alternative 3 would require development at seven additional sites (Moccasin, Red Mountain Bar, Rock River, Oakdale Portal, Modesto Irrigation District Connection, San Joaquin Valve House, and Sunol Valley WTP).

When the three alternatives are compared, Chloramination Alternative 1 would affect the least number of facility sites, and four of the five affected sites under this alternative would also be affected by the other two alternatives. Chloramination Alternative 3 would provide the most operational flexibility, but would require more dechlorination and dechloramination facilities for discharges to the environment. Chloramination Alternative 1 would require development of the fewest facilities and thus would result in the least physical impacts on the environment. Therefore, Chloramination Alternatives 2 and 3 were eliminated from further consideration in the EIR, since they would result in disturbance of additional sites and in greater environmental impacts when compared to Chloramination Alternative 1. The proposed project, a slight variation on Chloramination Alternative 1, would locate the ammonia feed and chlorine trim at the San

TABLE VII-1
CHLORAMINATION ALTERNATIVES

Site	Chloramination Alternative 1	Chloramination Alternative 2	Chloramination Alternative 3
Moccasin	- -	- -	Chlorine Feed (P)
Red Mountain Bar	- -	- -	Dechlorination
Rock River (or at Oakdale Portal)	- -	Chlorine Feed (P)	Chlorine Feed (S) Ammonia Feed
Oakdale Shaft	- -	- -	Dechloramination
Modesto Irrigation District Connection	- -	Dechlorination	Dechloramination
San Joaquin Valve House	- -	Dechlorination	Dechloramination
Tesla Portal	Chlorine Feed (P)	Ammonia Feed Chlorine Feed (S)	Chlorine Feed (S)
San Antonio Pump Station	Dechlorination	Dechloramination	Dechloramination
Alameda West	Ammonia Feed Chlorine Feed (S)	- -	- -
Sunol Valley WTP	- -	Ammonia Feed	Ammonia Feed
Pulgas Site	Dechloramination	Dechloramination	Dechloramination
Harry W. Tracy WTP	Ammonia Feed	Ammonia Feed	Ammonia Feed

P = Primary
S = Secondary
WTP = Water Treatment Plant

SOURCE: San Francisco Water Team, 1996

Antonio Pump Station instead of at the Alameda West Portal. This variation was identified during the conceptual design phase of the project, when it was determined that the physical topography of the Alameda West Portal site could not accommodate the proposed facilities.

E. FACILITY SITING ALTERNATIVES – PULGAS AREA

Under the proposed project, the proposed dechloramination facility and contactor basin/pipeline would be located south of the Pulgas Water Temple and its associated parking lots, west of Cañada Road. Due to the biological sensitivity of the Pulgas site vicinity, a number of alternative locations were considered where the project's objective—to remove chlorine and ammonia from chloraminated water in this location prior to discharge into Upper Crystal Springs Reservoir—could still be met. To achieve this objective, the proposed dechloramination facility and contactor basin/pipeline must be located downstream of the Pulgas Balancing Reservoir but

upstream of the Upper Crystal Springs Reservoir. Location of Siting Alternatives 1 and 2 are indicated in Figure III-17 and described below.

1.0 FACILITY SITING ALTERNATIVE 1

Under this alternative, the proposed dechloramination facility and contactor basin/pipeline would be located west of the Pulgas Water Temple and north of the Pulgas overflow channel. Flows would be diverted upstream (east) of the Pulgas Water Temple, treated, then returned to the Pulgas overflow channel downstream (west) of the temple. The diversion pipeline would extend north of the temple.

When compared to the proposed project, Siting Alternative 1 would have greater impacts on biological resources, but similar or fewer impacts on other resources. Under the proposed project, land use, geologic, hydrologic, public health, hazardous materials, traffic, and noise impacts would be less than significant, if recommended mitigation measures were implemented. Similarly, these impacts would be less than significant (with implementation of mitigation measures) under Siting Alternative 1 because of the proximity of this alternative to the project location. The potentially significant impact associated with stopping historic flows through the temple (discussed in Section IV.G, Cultural Resources) would also occur under this alternative, but could be mitigated with the proposed recirculation pipeline. This pipeline would provide limited flows of dechloraminated water through the temple. This alternative's location away from the temple and Cañada Road as well as its wooded setting would limit visibility of proposed facilities. Therefore, this alternative would have less of a visual impact when compared to the project location.

BIOLOGICAL RESOURCES

● Table VII-2 compares the impacts on biological resources under Siting Alternative 1 to impacts under the proposed project and Siting Alternative 2. While Figure III.C-1 indicates the general location of Alternative 1 biological resources, a detailed impact analysis for Siting Alternative 1 is provided in the *Biological Resources Background Report* prepared for this EIR (Environmental Science Associates, 2000). As under the proposed project, facility construction under this alternative could result in significant direct and indirect impacts on individual California red-legged frogs and San Francisco garter snakes as well as their habitats. Siting Alternative 1 is within 300 feet of breeding habitat for these two species, which is closer than the proposed project site.

Construction of this alternative could result in permanent impacts on wetlands and "waters of the U.S." under the jurisdiction of the U.S. Army Corps of Engineers (Corps) and to streambeds and banks under jurisdiction of the California Department of Fish and Game (CDFG). A drainage traverses the northern portion of this alternative site in an east-west direction. Approximately 1,500 square feet of willow riparian habitat are present along this drainage; ponding willow riparian habitat provides seasonally occupied California red-legged frog and San Francisco garter snake habitat that could be altered by implementation of this alternative. Other potential impacts include accidental release of deleterious fluids or incidental intrusion by construction workers or equipment. It is likely that a "take" of California red-legged frog and San Francisco garter snake

TABLE VII-2
COMPARISON OF BIOLOGICAL IMPACTS BY ALTERNATIVE

Alternative	Potential Biotic and Wetland Impacts
Siting Alternative 1	Potential impacts to significant (heritage) and native trees and significant plant communities (willow riparian). Potential wetland impacts could occur at the drainage that traverses the northwestern portion of the site. Approximately 1,500 square feet of willow riparian habitat occurs at this site. Potential significant and unavoidable impacts to San Francisco garter snake and California red-legged frog could occur in the drainage that traverses the northwestern portion of the site. Both species are expected to use the upland wooded portions of the site. Impacts to special-status bat species due to potential for destruction of individual bats, if present, and the loss of suitable foraging and roosting habitat in large-diameter trees. Potential impacts could occur to stink bells, western leatherwood, Dudley's lousewort, and large-flower linanthus in grassland openings of oak woodlands. Construction impacts could occur to passerines and raptors during the nesting season (approximately March 1 through August 15) and to saltmarsh common yellowthroat habitat north of the site.
Siting Alternative 2	Potential impacts to significant (heritage) and native trees and significant plant communities (willow riparian). Potential wetland impacts could occur to jurisdictional riparian willow habitat (wetlands) that cover the southern third of the site (approximately 13,000 square feet). Potential significant and unavoidable impacts to San Francisco garter snake and California red-legged frog in willow riparian habitat. The remaining wooded and grassland portions of the site could also be used by San Francisco garter snake and California red-legged frog. Potential impacts could occur to stink bells, western leatherwood, Dudley's lousewort, and large-flower linanthus in grassland openings of oak woodlands. Construction impacts could occur to passerines and raptors during the nesting season (approximately March 1 through August 15) and to saltmarsh common yellowthroat habitat north of the site.
Preferred Project Site	Potential impacts to significant (heritage) and native trees and significant plant communities (willow riparian). Potential wetland impacts could occur to an unnamed drainage north of the site and to a potential wetland seep located approximately in the center of the site. A permanent loss of <4,000 square feet of creek riparian (may be nonjurisdictional) and temporary loss of 500 square feet of creek channel could result. Potential impacts to San Francisco garter snake and California red-legged frog could occur in an unnamed drainage that delineates the northern edge of the site. Impacts to special-status bat species due to potential for destruction of individual bats, if present, and the loss of suitable foraging and roosting habitat in large-diameter trees. No impacts to special-status plant species would occur. Construction impacts could occur to passerines and raptors during the nesting season (approximately March 1 through August 15) in wooded areas.

SOURCE: ESA, 2000

would occur at Siting Alternative 1; mitigation measures would be developed during formal consultation with the U.S. Fish and Wildlife Service to mitigate this potential impact (see Section IV.C, Biological Resources). However, because of the importance of riparian habitats to these species and the high likelihood of species presence in the area, this potential impact would be significant and unavoidable. The area provides good-quality breeding, dispersal, and cover habitat for these species and would not be easily replaced through mitigation, unless proposed facilities could be designed to avoid this habitat. In comparison, measures could more easily be implemented at the proposed project site to reduce potential impacts on these species to a less than significant level.

Development of this alternative in conjunction with the proposed Pulgas Dechlorination Facility would likely contribute to the cumulative loss of upland habitat for the California red-legged frog and San Francisco garter snake. Potential cumulative impacts would result from the proximity of these project sites to excellent breeding and upland habitat for both species, and from the potential for accidental sedimentation or chemical release into the adjacent wetland mitigation area. Development of this site would result in a loss of aquatic breeding habitat, which could be compounded by the threat of accidental substance releases. In comparison, construction of facilities at the proposed project site would cause a temporary disturbance to potential upland habitat for both San Francisco garter snake and California red-legged frog, but these impacts would be temporary, and disturbed habitat would revegetate rapidly following site restoration.

Implementation of Siting Alternative 1 could result in significant direct and indirect impacts on special-status bat species, special-status plants (including stink bells [California Native Plant Society (CNPS) List 4 species], western leatherwood [CNPS List 1B], Dudley's lousewort [federal Species of Concern, California Rare, and CNPS List 1B], and large-flower linanthus [CNPS List 4]), and protected nesting birds. Potential impacts on bats and nesting birds would be similar to those of the proposed project. Mitigation measures required for the proposed project to reduce potential impacts on these resources to less than significant levels would also be required under Siting Alternative 1.

2.0 FACILITY SITING ALTERNATIVE 2

Siting Alternative 2 would locate the proposed dechloramination facility and contactor basin/pipeline west of the Pulgas Water Temple and south of the Pulgas overflow channel. Flows would be diverted upstream of the Pulgas Water Temple, treated, then returned to the Pulgas overflow channel downstream of the temple. The diversion pipeline would extend south of the Pulgas Water Temple.

Similar to Siting Alternative 1, Siting Alternative 2 would have greater impacts on biological resources, but similar or fewer impacts on other resources than the proposed project. Under the proposed project, land use, geologic, hydrologic, public health, hazardous materials, traffic, and noise impacts would be less than significant with implementation of mitigation measures. Because of the proximity of this alternative to the project location, these impacts would be less than significant (with implementation of mitigation measures) under this siting alternative. The potentially significant impact associated with stopping historic flows through the temple

(discussed in Section IV.G, Cultural Resources) would also occur under this alternative, but could be mitigated with the proposed recirculation pipeline. This pipeline would provide limited flows through the temple. This alternative's location away from the temple and Cañada Road as well as its wooded setting would limit visibility of proposed facilities. Therefore, this alternative would have less of a visual impact when compared to the project location.

BIOLOGICAL RESOURCES

- Table VII-2 compares the impacts on biological resources under this alternative to impacts under Siting Alternative 1 and the proposed project. While Figure III.C-1 indicates the general location of Alternative 1 biological resources, a detailed impact analysis for Siting Alternative 2 is included in the *Biological Resources Background Report* prepared for this EIR (Environmental Science Associates, 2000). As under the proposed project, facility construction under this alternative could result in significant direct and indirect impacts on individual California red-legged frogs and San Francisco garter snakes as well as their habitats. Siting Alternative 2 is within 300 feet of California red-legged frog and San Francisco garter snake breeding habitat, similar to Siting Alternative 1, but closer than the proposed project site.

Construction of this alternative could result in permanent impacts on willow riparian habitat and grassland areas on the project site, and these areas could be subject to CDFG regulation and Corps jurisdiction under Section 404 of the Clean Water Act. The southern one-fourth to one-third of the site (13,000 square feet) consists of willow riparian habitat and is considered potential upland (and possibly aquatic) habitat for San Francisco garter snake and California red-legged frog. The remaining wooded and grassland portions of the site could also be used by these two species. It is likely that a "take" of California red-legged frog and San Francisco garter snake would occur at Siting Alternative 2; mitigation measures would be developed during formal consultation with the U.S. Fish and Wildlife Service to mitigate this potential impact (see Section IV.C, Biological Resources). Impacts to the California red-legged frog and San Francisco garter snake under this alternative would be slightly greater than those under Alternative 1, because a greater amount of aquatic habitat would be destroyed. However, because of the importance of riparian habitats to these species and the high likelihood of species presence in the area, this potential impact would be significant and unavoidable. This area provides good-quality breeding, dispersal, and cover habitat for these species and would not be easily replaced through mitigation. In comparison, measures could be implemented at the proposed project site to reduce potential impacts on these species to a less than significant level.

As with Siting Alternative 1, development of this alternative in conjunction with the proposed Pulgas Dechlorination Facility would likely contribute to the cumulative loss of upland habitat for the California red-legged frog and San Francisco garter snake. Potential cumulative impacts would result from the proximity of these project sites to excellent breeding and upland habitat for both species, and from the potential for accidental sedimentation or chemical release into the adjacent wetland mitigation area. Development of this site would result in a loss of aquatic breeding habitat, which could be compounded by the threat of accidental releases of deleterious substances.

Implementation of Siting Alternative 2 could result in significant direct and indirect impacts on special-status plants (including stink bells, Dudley's lousewort, and large-flower linanthus) and protected nesting birds. Potential impacts on nesting birds would be similar to those under the proposed project and Siting Alternative 1. Mitigation measures required for the proposed project to reduce potential impacts on nesting birds to a less than significant level would also be required under Siting Alternative 2.

3.0 OTHER FACILITY SITING ALTERNATIVES CONSIDERED

Other siting alternatives were considered to reduce or avoid certain impacts on biological and cultural resources. One alternative relocated the proposed dechloramination facility and contactor basin/pipeline east of Cañada Road (SFWT, 2000). Another alternative consolidated the two pipeline trenches into a single, larger trench (following the proposed diversion pipeline alignment east of the temple) in an attempt to reduce construction impacts (SFWT, 2000). Both alternatives would return the dechloraminated water to the upstream (east) side of the Pulgas Water Temple, eliminating the need to simulate flows with a recirculating pump. In addition, both alternatives would reduce impacts on sensitive biological resources (e.g., California red-legged frog and San Francisco garter snake breeding and upland habitat).

Although other siting alternatives could reduce or avoid impacts on biological and cultural resources, further analysis determined that these alternatives could pose greater construction impacts than the proposed project (e.g., more tree removal, disruption of recreational uses along Cañada Road and at the temple) because more extensive facilities, such as additional pumping facilities and pipelines across Cañada Road, would be required. These alternatives would be more operationally complex than the proposed project, changing the system from a passive, gravity-flow system to a pumped system (SFWT, 2000). Additional pumps would increase long-term operational energy demands and could result in overflows of dechloraminated water in the vicinity of new pumping facilities (SFWT, 2000). Since mitigation measures are available to reduce project impacts to a less than significant level, implementation of these alternatives would not be necessary to avoid identified impacts on biological and cultural resources. In addition, implementation of the proposed project with mitigation measures would avoid the construction impacts associated with these alternatives. Finally, the increased operational complexity of these alternatives would not meet the project's overall purpose to improve the reliability of the water supply system.

F. OTHER ALTERNATIVES CONSIDERED

This group of alternatives considers the possibility that only some components of the proposed project would be constructed, but not all components. For example, the residual disinfection process could be converted from free chlorine to chloramine by construction of only the proposed facilities at the San Antonio Pump Station and at the Harry W. Tracy WTP. This would mean that specific facilities, such as the proposed Pulgas dechloramination facility or the dechlorination facilities at secondary discharge locations, would not be constructed. If this occurred, the Stage 1 D/DBP Rule and the anticipated Stage 2 Rule would be met, while visual, biological, and cultural impacts at the

Pulgas site would be avoided. However, chloraminated water would be discharged into Crystal Springs Reservoir. Without the proposed dechloramination facility, the discharge of residual ammonia into the reservoir has the potential to increase the available nitrogen, which could impair water quality through algal blooms and subsequent deleterious effects (e.g., treatment, taste, and odor problems). Furthermore, without proposed dechlorination facilities at secondary discharge locations, discharge of chlorine to local surface water would result in violation of state water quality regulations.

Similarly, the project could be constructed without the proposed chlorination facility at the Tesla Portal. The removal of the Tesla Portal component would eliminate the potential for disruption of sensitive species in the Tesla Portal vicinity, and the SFPUC water system would continue to use the existing primary chlorination facilities. However, without the proposed Tesla Portal facility, the primary chlorination system would not have the improved reliability, and the facility would not be upgraded for seismic hazards or for chemical handling. Thus, this group of alternatives would not meet the project's ancillary objectives of complying with Basin Plan requirements and improving overall reliability in meeting drinking water regulations.

REFERENCES – Alternatives

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CHAPTER VIII

DRAFT EIR DISTRIBUTION LIST

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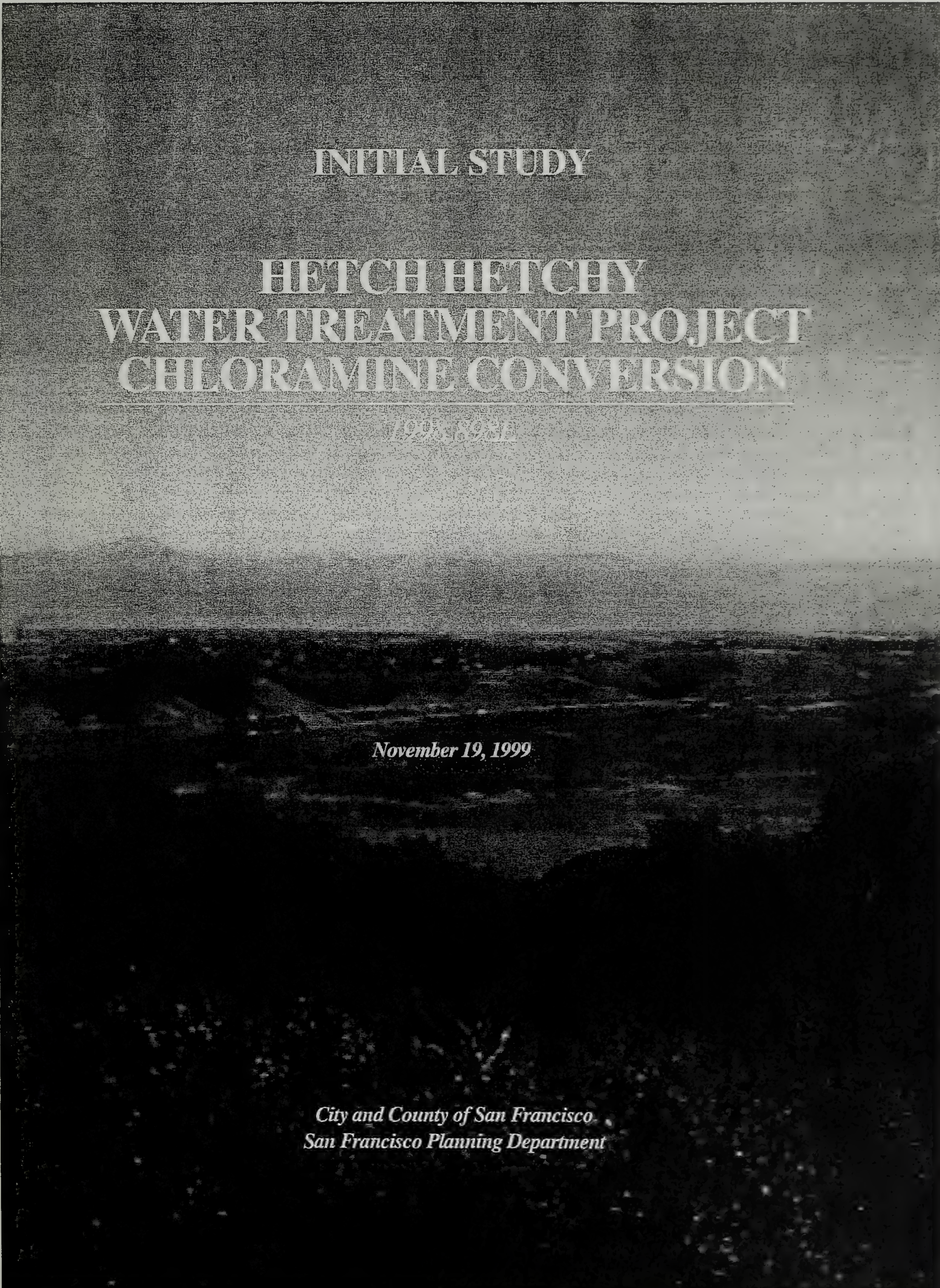
APPENDICES

APPENDIX A

INITIAL STUDY AND NOTICE OF PREPARATION



INITIAL STUDY

HETCH HETCHY WATER TREATMENT PROJECT CHLORAMINE CONVERSION

1998.898E

November 19, 1999

City and County of San Francisco
San Francisco Planning Department

NOTICE THAT AN ENVIRONMENTAL IMPACT REPORT IS DETERMINED TO BE REQUIRED

Date of this Notice: November 19, 1999

Lead Agency: City and County of San Francisco, Planning Department
1660 Mission Street, 5th Floor, San Francisco, CA 94103
Agency Contact Person: Paul Deutsch **Telephone:** (415) 558-6383

Project Title:	1998.898E – Hetch Hetchy Water Treatment Project - Chloramine Conversion	**Project Sponsor:**	San Francisco Public Utilities Commission (SFPUC)
		Contact Person:	Steve Leonard / Patty Mallett (415) 554-8978 / 554-8994

Project Address: SFPUC Water System from Tesla Portal to Harry W. Tracy Water Treatment Plant
Assessor's Block and Lot: Not Applicable
City and County: San Francisco, San Mateo, Santa Clara, Alameda, and San Joaquin Counties

Project Description: The purpose of the Hetch Hetchy Water Treatment Project--Chloramine Conversion is to improve the reliability of the SFPUC drinking water supply system to meet water quality requirements of the federal Stage 1 Disinfectant/Disinfection By-Products Rule, promulgated in 1998. Chlorine, which is currently used to disinfect the water supply system, has historically met water quality requirements for pathogen inactivation; however, use of chlorine as a residual disinfectant is known to result in the formation of low levels of halogenated compounds, known as disinfection by-products, some of which are suspected carcinogens. In February 1999, the Stage 1 Disinfectant/ Disinfection By-Products Rule became effective and lowered the allowable levels of disinfection by-products in drinking water. The Rule requires public water systems to adopt and implement the requirements of this regulation within two years from promulgation, with a possible extension of up to two additional years if approved. The SFPUC is proposing that the residual disinfectant for the SFPUC water supply system be converted from chlorine to chloramine, a combination of chlorine and ammonia. Use of chloramine as a residual disinfectant would reliably lower the levels of disinfection by-products to levels below the maximum levels mandated in this new regulation. The Chloramine Conversion Project would require construction of facilities at multiple locations along the SFPUC water system. The types of facilities would include: chlorine and ammonia feed systems; dechlorination and dechloramination facilities; chemical storage systems; and ancillary roadways and pipelines. Most construction would occur at the following locations:

1. Tesla Portal in San Joaquin County, south of Tracy,
2. San Antonio Pump Station in the Sunol Valley in Alameda County,
3. Pulgas Water Temple in San Mateo County, and
4. Harry W. Tracy Water Treatment Plant in San Mateo County.

In addition, the conversion to chloramine may require physical and/or operational modifications to the water distribution systems throughout the SFPUC service area, including those in the City and County of San Francisco and those in the Peninsula and East and South Bay areas served by the SFPUC system.

THIS PROJECT MAY HAVE A SIGNIFICANT EFFECT ON THE ENVIRONMENT AND AN ENVIRONMENTAL IMPACT REPORT IS REQUIRED. This determination is based upon the criteria of the Guidelines of the State Secretary for Resources, Sections 15063 (Initial Study), 15064 (Determining Significant Effects), and 15065 (Mandatory Findings of Significance), and the following reasons, as documented in the Initial Study for the project, which is attached.

The Deadline for Filing an Appeal to the Planning Commission of this Determination that an EIR is required is December 10, 1999. An appeal requires: 1) a letter specifying the grounds for appeal, and 2) a $209.00 filing fee.

The public is invited to comment on the scope of the EIR. Such comments must be received by December 20, 1999 to ensure consideration in preparing the Draft EIR.

Paul S. Deutsch / for

HILLARY E. GITELMAN, Environmental Review Officer

Hetch Hetchy Water Treatment Project--Chloramine Conversion
Initial Study
1998.898E

I. PROJECT DESCRIPTION

A. BACKGROUND

The San Francisco Public Utilities Commission (SFPUC) is responsible for providing a safe and reliable drinking water supply for 2.4 million customers in San Francisco and portions of San Mateo, Santa Clara, and Alameda counties. This water supply, referred to as the SFPUC water supply system, originates from three sources: Tuolumne River in the Sierra Nevada mountains, local runoff from watersheds in Alameda and Santa Clara counties, and local runoff from watersheds in San Mateo County. This water is conveyed about 150 miles through a series of aqueducts, pipelines, tunnels, and reservoirs to the SFPUC service area in the Bay Area.

The SFPUC has conducted extensive studies on the SFPUC water supply system for over a decade to determine the treatment processes and facilities needed to meet existing and anticipated state and federal drinking water regulations.[1] The studies included extensive water quality testing as well as identification and evaluation of alternative treatment methods and facilities needed for improvements related to disinfection, corrosion control, ozonation, and filtration processes. Results of one of the studies determined that use of the current disinfection method for the water supply system would not reliably meet the federal Disinfectant/Disinfection By-Products Rule. That study concluded that the residual disinfectant should be converted from chlorine to chloramine to reliably lower the levels of disinfection by-products to levels below the maximum levels mandated in this new regulation. The resulting improvement project, the Hetch Hetchy Water Treatment Project--Chloramine Conversion, is the subject of this Initial Study and forthcoming Environmental Impact Report (EIR).

B. PROJECT OBJECTIVES

The overall purpose of the Hetch Hetchy Water Treatment Project--Chloramine Conversion is to improve the reliability of the SFPUC drinking water supply system to meet water quality requirements of the Stage 1 Disinfectant/Disinfection By-Products Rule, a federal drinking water regulation adopted by the U.S. Environmental Protection Agency (USEPA), which became effective in 1999. The proposed project is designed to comply with these regulations in a cost-effective, environmentally sensitive manner, with the minimum number of facilities needed to be compatible with the existing overall water supply system.

In addition, an ancillary project objective is to comply with the existing California Regional Water Quality Control Board requirements that prohibit discharge of chlorine or other substances that are toxic to aquatic organisms into reservoirs or creeks. The SFPUC is currently in the process of converting or

1 San Francisco Water Team, *Hetch Hetchy Water Treatment Project, Phase 1A Preliminary Engineering Report*, prepared for San Francisco Public Utilities Commission, August 1996.

constructing facilities to remove chlorine from the drinking water supply prior to discharge to surface water bodies in order to meet these discharge requirements. Since chloramine is more persistent than chlorine and may pose prolonged toxic conditions to aquatic organisms compared to chlorine, it would be even more important after the conversion to chloramine to remove chlorine from the water at all sites where chloraminated SFPUC system water may be discharged to the environment. Therefore, the purpose of some of the proposed facilities is to protect the environment from chloraminated water discharges in addition to improving water quality and providing reliability to meet water quality regulations.

C. OVERVIEW

Currently, the SFPUC water supply system is disinfected by free chlorine applied in the form of sodium hypochlorite. This disinfection method, while historically meeting water quality requirements for pathogen inactivation and controlling transmission of waterborne disease, results in the formation of low levels of halogenated compounds, known as disinfection by-products (DBPs), some of which are suspected carcinogens.

In February 1999, the federal Stage 1 Disinfectant/Disinfection By-Products Rule became effective and lowered the allowable levels of disinfection by-products in drinking water. The SFPUC determined that in order to reliably meet the requirements of this regulation, the system should convert from chlorination (i.e., the process of adding chlorine to water) to chloramination (i.e., the process of adding chlorine and ammonia to water to form chloramines) for residual disinfection. Conversion to chloramine would also help meet the federal Total Coliform Rule requirements for overall disinfection and reliability for public health protection. Chlorine for primary disinfection followed by chloramine for residual disinfection is currently being used successfully by numerous utilities nationwide, including these in the Bay Area: East Bay Municipal Utility District, Alameda County Water District, Santa Clara Valley Water District, Contra Costa Water District, and Marin Municipal Water District.

The SFPUC conducted conceptual engineering on chloramine conversion of the water supply system and identified a preferred alternative for achieving the project objectives.[2] The preferred alternative, also referred to as the proposed project in this Initial Study, would require construction of related facilities of limited size at locations in San Francisco, San Mateo, Alameda, and San Joaquin counties. Because the SFPUC water supply system extends over 150 miles, the project objectives could not be achieved by constructing new facilities at one centralized location. In addition to the facilities needed for chloramine conversion, the proposed project includes new facilities to comply with discharge requirements of the California Regional Water Quality Control Board for discharges affected by the chloramine conversion. The preferred alternative includes the minimum number of facilities that, in combination, would be required to meet the Stage 1 Disinfectant/Disinfection By-Products Rule as well as the associated discharge requirements of the California Regional Water Quality Control Board.

2 San Francisco Water Team, *Hetch Hetchy Water Treatment Project Chloramine Conceptual Design Report*, Final Draft, prepared for the San Francisco Public Utilities Commission, March 1999.

In addition to these site-specific project components, the chloramine conversion process would directly result in the need to improve circulation in water distribution systems and large treated water reservoirs in the SFPUC service area. Within the City and County of San Francisco, the chloramine conversion would require operational modifications and minor improvements to existing chlorine feed stations for local reservoirs operated by the SFPUC's City Distribution Division (CDD). In areas outside the City, the project would affect the water supply systems for members of the Bay Area Water Users Association (BAWUA) who purchase water wholesale from the SFPUC. As part of the proposed project, the SFPUC will coordinate with the CDD operations and BAWUA member agencies to help prepare them prior to start-up of the chloramine conversion project. BAWUA member agencies will need to evaluate their individual systems to assure they are adequately prepared for the chloramine conversion.

Design and construction of proposed facilities is estimated to require about two years, with project start-up scheduled for mid- to late 2002. The components of the proposed project are described in more detail below.

D. PUBLIC AND BAWUA AGENCIES OUTREACH

While implementation of chloramine conversion would increase reliability in meeting drinking water standards and improve public health protection, the associated change in water quality would result in various indirect effects to the 2.4 million customers in the SFPUC service area. The SFPUC will conduct a formal public outreach program as part of the Hetch Hetchy Water Treatment Project--Chloramine Conversion to notify, inform, and help prepare the 2.4 million customers in the SFPUC service area. The formal public outreach program will occur primarily during the year prior to conversion. The public outreach program will target kidney dialysis facilities (as required by the California Department of Health Services) and "sensitive" users that can be affected by chloraminated water, including private and commercial owners of aquariums and fishponds. The SFPUC will also contact the major media to facilitate outreach to the general public.

The public outreach program is necessary to inform the public of the indirect effects of chloramine conversion and to help them prepare for the change in water quality. Most critically, the change in residual disinfectant would result in potentially negative effects to kidney dialysis facilities. The California Department of Health Services requires that all kidney dialysis facilities be upgraded to include chloramine removal equipment and be inspected and certified by the California Department of Licensing and Certification prior to systemwide conversion to chloramine, but not more than one year before conversion begins. In addition, due to the toxic effects of chloramine to aquatic life, aquarium and fishpond owners would need to institute pretreatment measures to remove chloramine as part of their operational practices. Other sensitive businesses and industries, such as those that currently remove chlorine from their process water, may also be affected by chloramine and could require additional treatment for removal of chloramines in their operations. The general public may perceive slight changes in taste and odor, associated mainly with a reduction in the chlorine odor. The SFPUC is developing the formal public outreach program for chloramine conversion concurrently with the environmental review process. For further information concerning the chloramination project and process, call the SFPUC project information line at 415-557-6738.

In addition, the SFPUC has initiated coordination and education to assist the BAWUA agencies to plan and prepare for the conversion. The SFPUC participates regularly in the BAWUA Water Quality Committee meetings and is conducting a series of workshops on chloramine conversion for the member agencies. The BAWUA agencies' outreach program will be expanded as the conversion date approaches. However, it is expected that BAWUA agencies would share in the public outreach and notification to water customers in their respective service areas.

E. PROPOSED TREATMENT PROCESSES

1) PROPOSED DISINFECTION METHOD—ADDITION OF CHLORINE AND AMMONIA

The SFPUC water supply system currently uses chlorine in the form of liquid sodium hypochlorite as the initial or primary disinfectant to inactivate bacteria, viruses, and pathogens; it then maintains lower levels of residual chlorine in the water to prevent re-growth of bacteria or pathogens in the transmission and distribution system. While chlorination provides rapid and effective disinfection to meet the disinfection requirements for bacteriological water quality standards, chlorination results in formation of disinfection by-products. Thus, to meet the new, more stringent standards for disinfection by-products of the Disinfectant/Disinfection By-Products Rule, the SFPUC proposes to implement a sequential disinfection strategy, combining chlorination for primary disinfection with chloramination for residual disinfection.

Chloramine is a combination of chlorine and ammonia. Similar to free chlorine, it acts as a disinfectant, but it is a more stable compound than chlorine, persists longer in the distribution system, and forms very low levels of disinfection by-products. However, chlorine is a much stronger biocide than chloramine and would still be required for primary disinfection. The proposed sequential disinfection method was determined to provide the most reliable disinfection of the SFPUC water system to achieve compliance with existing and proposed future water quality regulations.[3]

For the SFPUC water supply system, the proposed project would involve injecting and removing chemicals at various points along the system to meet the project objectives. The following subsection describes the existing and proposed treatment processes involving chemical addition and removal.

There would be no changes to the SFPUC water supply system, which originates in the Sierra Nevada mountains, until the water flows to the Tesla Portal on the west side of the San Joaquin Valley near the city of Tracy. At the Tesla Portal, the proposed project would involve replacing and upgrading the existing primary disinfection storage and feed facilities. Chlorine as sodium hypochlorite would continue to be injected to the water supply to meet the primary disinfection requirements. As the water flows west toward the Bay Area, ammonia would be injected at a new facility in the Sunol area in Alameda County; the ammonia would combine with the chlorine to form chloramine as a residual disinfectant. Additional chlorine would be added as needed to compensate for chlorine losses along the

3 San Francisco Water Team, *Hetch Hetchy Water Treatment Project, Phase 1A Preliminary Engineering Report*, prepared for San Francisco Public Utilities Commission, August 1996.

system and to maintain required levels of residual chloramine for disinfection to continue in the distribution system.

After the water flows west to the Bay Area, most of the disinfected water is conveyed in pipelines to the distribution systems that supply water customers. About 15 percent of the total annual water supply, however, is discharged to the Crystal Springs Reservoir in San Mateo County and stored to meet seasonal supply requirements. Water from Crystal Springs Reservoir is transferred to the San Andreas Reservoir and then treated at the Harry W. Tracy Water Treatment Plant near the town of San Bruno. The proposed project would modify the existing processes at the treatment plant by adding ammonia injection facilities. These facilities would inject ammonia into the water supply to form chloramine as the residual disinfectant, prior to distribution to water customers along the Peninsula and in San Francisco.

This proposed sequential disinfection process would meet the federal disinfection requirements of the Total Coliform Rule, the Enhanced Surface Water Treatment Rule, and the Stage 1 Disinfectant/ Disinfection By-Products Rule, thereby providing a high level of public health protection. The facilities required to perform this process are described in more detail below.

2) PROPOSED REMOVAL OF CHLORINE AND AMMONIA

The SFPUC water supply system includes a number of locations where disinfected drinking water is either intentionally discharged or may accidentally overflow into local surface water bodies. The California Regional Water Quality Control Board (RWQCB) prohibits the discharge of both chlorinated and chloraminated water to surface waters. Chlorine, present in both chlorinated and chloraminated waters, is toxic to aquatic life, and the RWQCB requires that all residual chlorine be removed from chlorinated and chloraminated water before the water is acceptable for discharge to surface waters. With chloraminated water, after the chlorine is removed, the ammonia portion of the chloramine is still present. The RWQCB has also set limits for ammonia levels in receiving waters, since under certain conditions, ammonia can be toxic to aquatic life. The toxicity of ammonia, however, is dependent upon the pH range of the receiving water. In the majority of cases, the pH of the receiving water body is within the desired range to limit or avoid toxic conditions, and discharge of ammoniated water to surface waters can be acceptable.

However, if ammoniated water is discharged to water bodies that are nitrogen-limited (i.e., the level of nitrogen is the critical nutrient in determining algae growth), the additional ammonia can contribute to the potential for algal blooms and eutrophication conditions in lakes and streams. Therefore, the SFPUC is conducting water quality studies to determine if Crystal Springs Reservoir is nitrogen-limited and to identify the potential effects from the additional ammonia-nitrogen that would be present in the dechloraminated discharge. If the studies indicate that Crystal Springs Reservoir is nitrogen limited and that the additional ammonia from chloraminated water would prove detrimental to water quality, then the SFPUC proposes to remove ammonia as well as chlorine from this discharge. If the studies are inconclusive about any detrimental effects from the nitrogen, then only chlorine would be removed from the water, and the pH would be adjusted to prevent ammonia toxicity, and the proposed dechloramination facility, described in the next section, would not be constructed.

To protect local surface waters, the proposed project includes permanent dechlorination facilities at overflow points along the system, such as Alameda East and Alameda West Shafts in the Sunol Valley, to replace the currently used portable dechlorination facilities. These facilities would typically use sodium thiosulfate or another type of dechlorination chemical (e.g., citric acid or sodium bisulfite) to remove the chlorine before water can be discharged to surface waters.

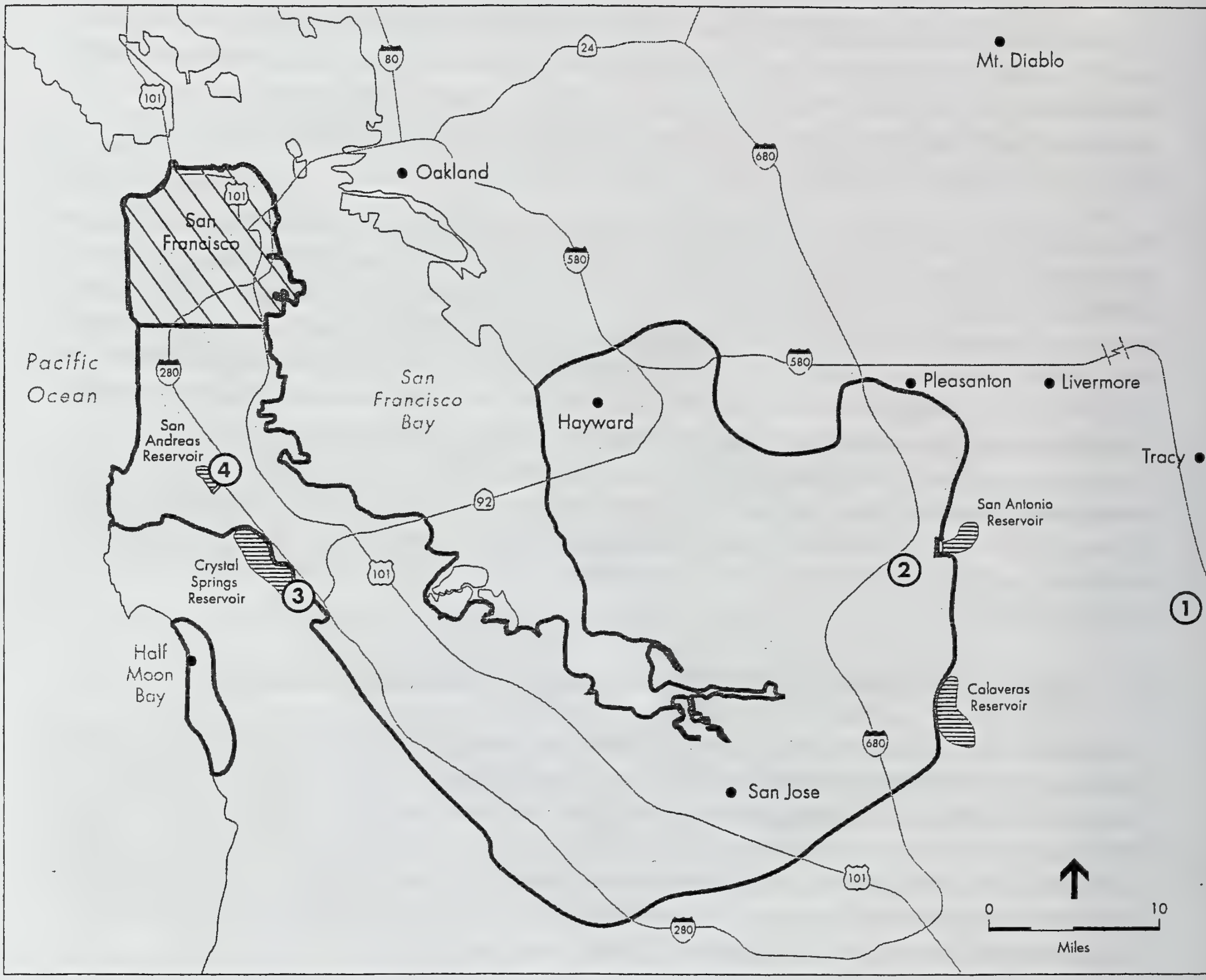
At the Crystal Springs Reservoir, the SFPUC proposes to remove chlorine as well as to reduce ammonia levels prior to discharge of the water supply to the reservoir in order to protect surface water quality. Therefore, the proposed project includes facilities for dechloramination (i.e., removal of chlorine and reduction of ammonia) from the water prior to discharge to Crystal Springs Reservoir. Dechloramination is a two-step process that involves first lowering the ammonia levels and then removing the chlorine. To lower the ammonia levels, an acidic compound (e.g., sulfuric acid, hydrchloric acid, or carbon dioxide) would first be added to lower the pH, which is needed for chemical efficiency in the next step; supplemental sodium hypochlorite would then be added to oxidize the ammonia portion of the chloramine to release nitrogen gas, thereby lowering the ammonia concentration. This process would be followed by addition of a dechlorinating chemical, typically sodium bisulfite, to convert all the chlorine to chloride, an inert, nontoxic form. The dechloraminated water would then be discharged to Crystal Springs Reservoir.

F. PROPOSED NEW FACILITIES – PROJECT-LEVEL ANALYSIS

The Hetch Hetchy Water Treatment Project--Chloramine Conversion would require construction of new facilities at multiple locations along the SFPUC water supply system. Facility locations are indicated in Figure 1, and Table 1 summarizes the physical facilities required at each site. Physical environmental effects associated with construction and operation of the facilities described in this section are analyzed in this Initial Study at a project level, which means that detailed site-specific analysis of potential effects is provided for each project location. For those environmental topics requiring further environmental review in the EIR, these project components will also be analyzed at a project level in the EIR.

All proposed sites for the SFPUC improvements are located on lands owned by the City and County of San Francisco, and at all sites, proposed facilities are by necessity located in proximity to existing facilities related to the water system. The new facilities or modifications to existing facilities would occur at four main locations and are described below from east to west, following the direction of the water flow:

1) Tesla Portal off of Vernalis Road in San Joaquin County, near Tracy. A new chlorine storage and feed facility would be constructed at a vacant site near the existing chlorine feed system, about 100 feet east of the watershed keeper's residence. This facility would replace the existing chlorine feed facility, which would be abandoned. The new facility would be about 100 feet wide by 150 feet long and 30 feet high; it would accommodate increased chlorine storage as well as chemical metering pumps and related equipment. The new facility would maintain the existing level of chlorine added to the water supply as the primary disinfectant. About 300 linear feet of 6-inch-diameter buried double-contained pipe would be installed to convey the liquid chlorine to the water supply. The new facility would have upgraded seismic and chemical storage and handling design features. A new loop road, about 1,200 feet long and 20 feet wide, would replace the existing road to



FACILITY LOCATIONS

1. Tesla Portal Site
2. San Antonio Pump Station Site and Alameda East and West Shafts Sites
3. Pulgas Water Temple Site and Pulgas Balancing Reservoir Site
4. Harry W. Tracy Water Treatment Plant Site

City and County of San Francisco City Distribution Division (CDD)

Bay Area Water Users Association (BAWUA) Member Agencies Aggregate Service Area

SOURCE: Yuki A. Kawaguchi, Cartographer

1998.898E: Hetch Hetchy Water Treatment Project-Chloramine Conversion / 990095

Figure 1
Project Location

TABLE 1
SUMMARY OF CHLORAMINE CONVERSION PROJECT COMPONENTS

Location[1]	Project Component	Description of Structures	Roadway	New Impervious Surfaces	Pipelines
1. Tesla Portal, San Joaquin County	Replace and upgrade existing chlorine feed and storage facility; abandon existing structure.	Chemical building: 100 feet wide x 150 feet long x 30 feet high Retaining Wall: 200 feet long x 8 to 12 feet high	Access and loop road: 1,100 linear feet x 20 feet wide Paved parking: 42 feet x 60 feet	15,000 + 22,000 + 2,520 = 39,520 square feet	300 linear feet of 6-inch-diameter buried double-contained pipeline (liquid chlorine & sample pipeline)
2a. San Antonio Pump Station, Sunol Valley, Alameda County	Construct a new ammonia and chlorine feed facility.	Chemical building: 100 feet wide x 150 feet long x 30 feet high	Access and loop road: 400 feet x 20 feet Paved parking: 40 feet x 30 feet	15,000 + 8,000 + 1,200 = 24,200 square feet	1,000 linear feet of 4- to 6-inch diameter buried double-contained pipeline (liquid chlorine & ammonia)
2b. Alameda East Shaft, Sunol Valley, Alameda County	Construct a dechlorination facility.	Permanent shed: 20 feet wide x 30 feet long x 12 feet high	Existing	600 square feet	200 linear feet of 4- to 6-inch diameter buried double-contained pipeline (sodium thiosulfate)
2b. Alameda West Shaft, Sunol Valley, Alameda County	Construct a dechlorination facility.	Permanent shed: 20 feet wide x 30 feet long x 12 feet high	Existing	600 square feet	200 linear feet of 4- to 6-inch diameter buried double-contained pipeline (sodium thiosulfate)
3a. Pulgas Water Temple, San Mateo County	Construct a dechloramination facility and pipeline.	Chemical building: 100 feet wide x 200 feet long x 30 feet high Buried pipeline contactor or Underground basin contactor (65,000 sq. ft.)	Access road: 200 feet x 20 feet Paved area: 100 feet x 50 feet Truck turnaround: 300 feet x 20 feet	20,000 + 4,000 + 6,000 = 30,000 square feet	4,600 linear feet of 10- to 12-foot-diameter pipeline contactor or rectangular basin (65,000 sq. ft.) About 1,000 linear feet of 6-inch-diameter buried double-contained pipeline (liquid and chemical pipeline)

TABLE 1 (Continued)
SUMMARY OF CHLORAMINE CONVERSION PROJECT COMPONENTS

Location[1]	Project Component	Description of Structures	Roadway	New Impervious Surfaces	Pipelines
3b. Pulgas Balancing Reservoir, San Mateo County	Upgrade reservoir and construct chlorine boosting station	Internal piping - Inlet/outlet pipe: 84-inch-diameter x 250 feet – Inlet/outlet pipe: 66-inch-diameter x 255 feet - Relocate two flap gates Chlorine boosting station located at site 3a, above	Existing	None Included in site 3a, above	Internal only 500 linear feet of 6-inch pipeline under Cañada Road
4. Harry W. Tracy WTP, San Mateo County	Construct a new ammonia feed and storage facility.	Ammonia storage structure: 30 feet wide x 50 feet long x 30 feet high at one of two sites.	Existing	1,500 square feet	500 linear feet of 2- to 4-inch-diameter buried double-contained chemical pipeline
5. Secondary Discharge Locations, Alameda, San Mateo and San Francisco Counties	Construct dechlorination facilities	Permanent facilities: 20 feet wide x 30 feet long x 12 feet high Portable facilities: trailer-mounted	Varies	Permanent: 600 square feet Portable: none	Varies
6. CDD Facilities, San Francisco County	Implement various modifications to existing reservoirs, tanks, pumping stations, or chlorination facilities.	Typically, no new structures; modifications to existing structures only.	Typically existing	Typically, none	Buried double-contained chemical pipelines, up to several hundred feet long, 1- to 4-inch diameter
7. BAWUA Members' Facilities, San Mateo, Santa Clara and Alameda Counties	Implement various modifications to existing reservoirs and distribution systems	Currently unknown.	Typically existing	Unknown	Currently unknown

[1] See Figure 1 for project locations.

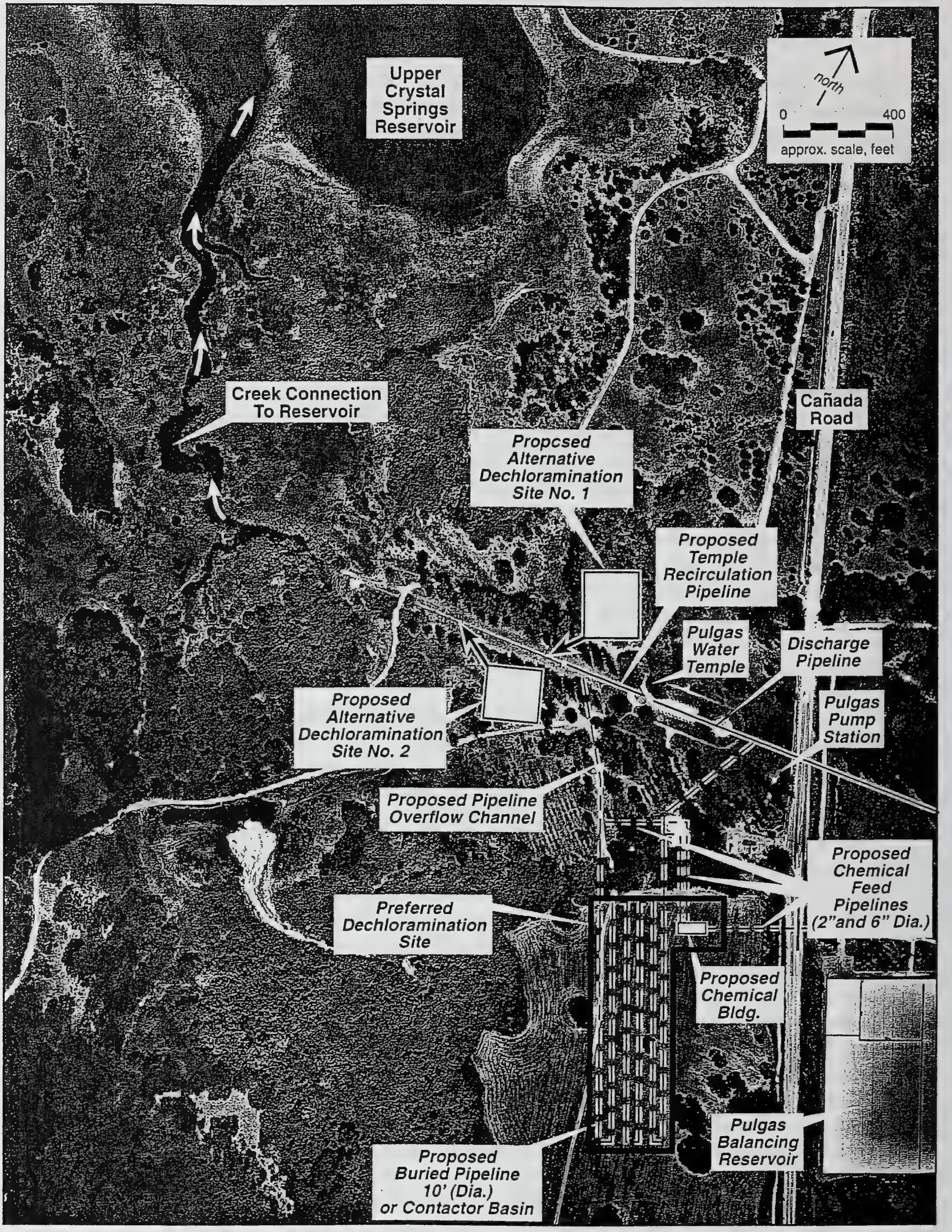
improve access for chemical delivery trucks, and a 200-foot-long and 8- to 12-foot-high retaining wall would be constructed to support a portion of the roadbed. One existing outbuilding next to the garage at the watershed keeper's residence would be demolished.

2) (a) San Antonio Pump Station on Calaveras Road in the Sunol Valley in Alameda County. A new ammonia and chlorine feed facility would be constructed at a vacant site adjacent to the San Antonio Pump Station, about 120 feet west of the existing structure. The new facility would be similar in size to the existing San Antonio Pump Station, about 100 feet wide by 150 feet long and 30 feet high. It would accommodate ammonia and chlorine storage as well as chemical metering pumps and related equipment. About 1,000 linear feet of 6-inch buried double-contained pipe would be installed to convey liquid chlorine and ammonia to the water supply to maintain the residual level of chloramine disinfectant. A new access point off Calaveras Road would be added, and a loop road would be constructed around the building for chemical delivery.

   (b) Alameda East and Alameda West Shafts on Calaveras Road in the Sunol Valley, in Alameda County. The proposed project may require construction of permanent dechlorination facilities at the existing Alameda East and Alameda West shafts in the Sunol Valley, near the San Antonio Pump Station. These facilities would be needed to protect Alameda Creek water quality in the event of incidental overflows or discharges of water from these shafts. Portable dechlorination facilities are currently used at Alameda East, but to improve reliability, a permanent structure (about 20 feet wide by 30 feet long by 12 feet high) containing a chemical metering pump and limited chemical storage would be constructed at both sites. The new facility would be within 50 feet of existing structures and valve houses at these locations. About 200 linear feet of 6-inch buried double-contained pipe would be installed to carry a chemical solution of sodium thiosulfate to the water supply.

3) (a) Pulgas Water Temple on Cañada Road near Woodside, San Mateo County. A dechloramination facility would be constructed to remove chlorine and to reduce ammonia levels prior to discharge to Crystal Springs Reservoir. The facility would include an aboveground chemical storage structure and operations building, about 100 feet wide by 200 feet long and 30 feet high, and would accommodate chemical storage as well as chemical metering pumps and related equipment. About 1,000 linear feet of 6-inch-diameter buried double-contained piping would be installed to carry liquid chemicals. In addition, to provide adequate contact time to reduce ammonia levels, a pipeline contactor (about 4,600 feet of 10- to 12-foot-diameter buried pipe) or an underground contactor basin (65,000 sq. ft.) would be installed adjacent to the proposed chemical storage structure. A pipeline to divert water from the Pulgas Pump Station about 350 feet east of the Pulgas Water Temple would be installed to convey water to the dechloramination facility for removal of chlorine and reduction of ammonia, and then another pipeline would convey the dechloraminated water back to the discharge channel about 100 feet behind the Water Temple. Because these pipelines would divert the existing water flow away from the Pulgas Water Temple proper, the project would include a pumping system to transfer a small side stream of dechloraminated water (about one to two million gallons daily) back through the Water Temple on a scheduled or planned basis. This system would maintain the sound of flowing water at the historic Water Temple site. The pipeline would either be buried or submerged within the water channel downstream of the Water Temple. The pump system could be controlled to operate during specific hours each day or only during specific events. The preferred site for the dechloramination facility and the preliminary pipeline alignments are shown in Figure 2.

   As shown in Figure 2, the preferred site for the dechloramination facility is located in a meadow along a row of mature trees directly south of the parking lot at the Pulgas Water Temple, and the



SOURCE: SFWT San Francisco Water Team

1998.898E: Hetch Hetchy Water Treatment Project-Chloramine Conversion / 990095

Figure 2
Pulgas Area Facility Improvements and Alternative Facility Sites

structure would be located about 600 feet south of the Water Temple. A new access driveway would be built on Cañada Road, and a 300-foot-long truck turnaround would be built at the end of the 200-foot-long drive with a connection to an existing gravel service road. Two alternative sites, shown on Figure 2 as Proposed Alternative Sites No. 1 and No. 2, located about 600 feet west and 600 feet northwest, respectively, of the Pulgas Water Temple may be considered. These sites are all currently vacant and have no public access.

(b) Pulgas Balancing Reservoir, east of Cañada Road near the Pulgas Water Temple. The proposed project would include reservoir upgrades to improve circulation at the existing Pulgas Balancing Reservoir, a 60-million-gallon-capacity covered reservoir. These changes would consist of internal piping modifications necessary to reduce detention time and to increase mixing conditions. This upgrade would reduce the potential for nitrification (the biological oxidation of ammonia that results in loss of disinfectant residual), which is an adverse process that can occur when chloraminated water is stored for long periods of time with insufficient mixing. In addition, it may be necessary to include a chlorine boosting station at the dechloramination facility which would pump chlorine to the Pulgas Balancing Reservoir to maintain the total chlorine residual. This station could be incorporated within the footprint of the dechloramination facility but would require a pipeline crossing under Cañada Road from the boosting station to the balancing reservoir. Approximately 500 linear feet of 6-inch diameter double-contained pipeline would be installed under Cañada Road to carry chlorine to the balancing reservoir.

4) Harry W. Tracy Water Treatment Plant on Crystal Springs Road in San Bruno, San Mateo County. A new ammonia storage and feed facility would be built at the water treatment plant at one of two possible locations within the plant boundaries. The new facility would require an area about 30 feet wide by 50 feet long and 30 feet high and would use the existing operations building at the plant for ancillary equipment, controls, and staff area. About 500 linear feet of buried chemical pipeline, 2 to 4 inches in diameter and double-contained, would be installed.

Following completion of construction and start-up activities required for the conversion process, operation of the SFPUC water supply system would require a limited increase in SFPUC staff over existing levels. Additional staff time would be required for operation and maintenance of the new facilities, at the water treatment plant, and for incorporation of chloramination into the systemwide operations.

G. PROPOSED FACILITIES – PROGRAM-LEVEL ANALYSIS

In addition to the new construction at the facility locations described above, the Hetch Hetchy Water Treatment Project--Chloramine Conversion would possibly require new facilities or modifications to existing facilities at other locations along the SFPUC water supply system or within the SFPUC service area. Changes in operations and/or maintenance to accommodate the conversion at existing facilities would also likely be required. These components of the proposed project are shown in Table 1 and include: secondary discharge locations where planned water discharges or incidental overflows may occur, the CDD facilities, and the BAWUA agencies' facilities.

At this time, however, site-specific engineering and design information are not available for these project components; therefore, these components are analyzed at a program level in this Initial Study. A program level of analysis is performed when site-specific analysis is not currently possible or is not

applicable. Instead, the environmental analysis is based on a typical scenario of similar, related facilities. For those environmental topics requiring further environmental review in the EIR, these project components will also be analyzed at a program level in the EIR. Depending on site-specific design and siting conditions, some aspects of these project components may require additional environmental review at a later date when site-specific information becomes available. The project components analyzed at a program level are described below (numbering corresponds to the list in Table 1):

5) Dechlorination Facilities at Secondary Discharge Locations. Dechlorination facilities would be required downstream of the proposed chlorine and ammonia feed points to reduce the impacts of chlorinated water in the event of intermittent discharges or overflows to creeks or other surface waters at about 14 locations along the SFPUC water supply system. These secondary discharges could be either planned discharges (i.e., water transfers) or incidental overflows. Dechlorination facilities would consist of either a permanent structure or a portable, trailer-mounted facility. These facilities would remove chlorine from the chloraminated water supply prior to discharge to creeks or surface waters to protect aquatic resources from the potentially toxic effects of chlorine and chloramine.

   Permanent dechlorination facilities, similar in size and design to the facility described above for the Alameda East and West shafts, would be required at locations where unplanned overflows could otherwise discharge chloraminated water automatically to sensitive surface waters. Portable, trailer-mounted chemical feed systems, consisting of chemical metering pumps and limited chemical storage, would be used at locations where controlled discharges or planned water transfers are conducted, such as at the Lake Merced Pump Station. These planned events, which historically have occurred only a few times each year, require that water be dechlorinated prior to discharge to a surface water body. Typically the chemicals used for dechlorination are sodium thiosulfate or sodium bisulfite, which when added to chlorinated water is not harmful to the aquatic environment at the doses applied for this use.

   This component of the proposed project would not alter the location or frequency of secondary discharges, but it would ensure the operation of either permanent or portable dechlorination facilities to remove chlorine before discharge to surface waters. This would be an improvement over existing conditions, and therefore, a beneficial water quality impact. Since the dechlorination facilities would be of limited size (possibly portable), located within or adjacent to existing water facilities, and operated only on an infrequent basis, no significant physical environmental effects would typically be anticipated. Although the discharges would result in an incremental increase in ammonia levels, these levels are not anticipated to result in water quality impacts (see checklist item 10, Water Quality, for more discussion). Only in the event of failure of the proposed dechlorination facility would there be a change from existing conditions, and any accidental or inadvertent secondary discharges would consist of chloraminated instead of chlorinated water. Therefore, the EIR will limit the program-level analysis to the potential hazard to aquatic resources and water quality of surface waters associated with such a failure, and the EIR will evaluate the potential effects of chloraminated discharges compared to the potential effects of chlorinated discharges. When site-specific information becomes available regarding the facility site and design at individual discharge locations, more detailed environmental review may be required to address any site-specific sensitive issues (e.g., construction impacts, geotechnical hazards, drainage, biological or cultural resources) associated with a permanent dechlorination structure.

6) Modifications to City Distribution Division (CDD) System. The CDD water distribution system within the City and County of San Francisco includes 10 reservoirs, 7 tanks, 18 pumping stations, and a network of pipelines throughout the City. The change in water quality associated with the chloramine conversion would require operational modifications and improvements to some chemical feed systems in the CDD distribution system in the City. To accommodate the change in residual disinfectant, operational modifications to various aspects of the CDD system would be required to control nitrification and to improve water circulation. Typical operational modifications would include: cleaning reservoirs and flushing pipelines prior to chloramine conversion; increasing water quality monitoring; and possibly increasing frequency of reservoir drawdowns. In addition, improvements to some chemical feed facilities in the CDD system would be needed to improve reliability of disinfection for these systems. Other on-going and planned CDD improvement projects would be beneficial to the chloramine conversion project in terms of maintaining high water quality and improving reliability; these are included below under "Related Projects."

   Typically, operational changes to the CDD system would involve existing facilities and would not result in physical environmental effects, with the possible exception of effects associated with increases in staffing and with cleaning of reservoirs. Therefore, operational changes to the CDD facilities are discussed in this Initial Study under population, traffic, and water quality. The internal piping and other minor modifications to the chemical feed systems could result in construction impacts (i.e., traffic, air quality, noise, and community disruption); depending on site-specific design and siting conditions, additional environmental review may be required when site-specific information becomes available.

7) Modifications to Bay Area Water User Association (BAWUA) Member Agencies' Facilities. The change in water quality associated with chloramine conversion may require operational or structural modifications of existing facilities or may require construction of new facilities at the water distribution systems operated by the BAWUA member agencies. Unlike the CDD system, which uses exclusively SFPUC water, some BAWUA agencies use different combinations of water supply sources. A major concern for BAWUA agencies would be the need to make adjustments when blending chloraminated SFPUC water with other water supplies, including chlorinated, other chloraminated, or unchlorinated water supplies. Structural and/or operational modifications of the BAWUA members' water distribution systems may be required to accommodate the chloramine conversion. These modifications could include new monitoring programs, new chemical feed facilities, reservoir improvements, distribution system modifications, cleaning and flushing programs, and possibly new blending facilities. As required for the SFPUC system, BAWUA agencies may also need to include dechlorination facilities at secondary discharge locations to protect surface waters. Prior to chloramine conversion, the BAWUA member agencies will need to conduct a comprehensive evaluation of their individual systems to determine the physical and/or operational modifications needed for their systems.

   Because the modifications to the BAWUA member agencies' systems have not yet been identified, the EIR will describe typical modifications that may be required and address program-level impacts on water quality. When site-specific information is available, further environmental review may be required by the particular water agency with jurisdiction over their project. Environmental review would be conducted under the auspices of that jurisdiction's California Environmental Quality Act (CEQA) lead agency. Therefore, specific improvements related to BAWUA members' facilities will not be considered in this Initial Study or in the EIR.

H. RELATED PROJECTS – CUMULATIVE EFFECTS

The SFPUC has other ongoing or planned projects in the vicinity of the proposed project locations or along the SFPUC water supply system that may contribute to cumulative environmental effects. The EIR analysis will assess the cumulative effects of project construction and operation in combination with the following projects:

- Interim Dechlorination Facility and Pulgas Balancing Reservoir Overflow, near the Pulgas Water Temple area
- Pulgas Pump Station Emergency Power, near the Pulgas Water Temple area
- City Distribution Division Capital Improvements Projects
- Sunol Water Treatment Plant Improvement Project
- Fluoride and Corrosion Control Feed System
- Alameda Watershed Management Plan
- Peninsula Watershed Management Plan
- Harry W. Tracy Water Treatment Plant—various improvement projects
- Supervisory Control and Data Acquisition (SCADA) Projects
- Alameda Creek Fisheries Project

Most of the projects relate either directly or indirectly to the Hetch Hetchy Water Treatment Project--Chloramine Conversion with regard to improved water quality reliability for the SFPUC water supply system. Some of the projects would occur within the vicinities of the proposed project locations, and construction activities could overlap depending on the implementation schedule for the various projects. Therefore, potential cumulative impacts from construction and operation of the proposed project in combination with construction and operation of the above-listed related projects will be evaluated in the EIR.

II. SUMMARY OF POTENTIAL ENVIRONMENTAL EFFECTS

A. EFFECTS FOUND TO BE POTENTIALLY SIGNIFICANT

This Initial Study examines the potential effects on the environment of the proposed Hetch Hetchy Water Treatment Project--Chloramine Conversion. The proposed project would result in physical effects on the environment only where specific facility improvements would occur within the SFPUC water system (including four facility locations and secondary discharge locations) and within the SFPUC service area (including the CDD and BAWUA member agencies' systems). This Initial Study has determined that potentially significant impacts on visual quality, biological resources, geology, water quality, hazards, and cultural resources could occur at the various facility locations and will require further analysis in an EIR. As noted above in Section I, site-specific CDD- or BAWUA agencies-related improvements may be subject to future environmental review when more specific information becomes available; many of these facilities may be categorically exempt from CEQA.

B. EFFECTS FOUND NOT TO BE SIGNIFICANT

The following potential impacts were determined to be either insignificant or mitigable to a less-than-significant level through measures included in the project. These items are discussed in Section III, below, and require no further environmental analysis in the EIR: population, air quality, energy/natural resources, and utilities/public services. Transportation/circulation and noise impacts were determined to be less than significant except at the Pulgas Water Temple site, where construction impacts may be a concern. In addition, certain project facilities were determined to result in less-than-significant impacts under specific environmental topics (e.g., visual impacts at the Tesla Portal facility location).

III. ENVIRONMENTAL EVALUATION CHECKLIST AND DISCUSSION

A. COMPATIBILITY WITH EXISTING ZONING AND PLANS

	Discussed	Not Applicable
1) Discuss any variances, special authorizations, or changes proposed to the City Planning Code or Zoning Map, if applicable.	____	X
2) Discuss any conflict with any adopted environmental plans and goals of the city or region, if applicable.	____	X

Except for proposed improvements to the CDD system associated with the chloramine conversion, all other new facilities associated with the proposed project would be located outside of the City and County of San Francisco and are not subject to San Francisco zoning regulations or General Plan policies. The four main facility locations are within the counties of San Mateo, Alameda, and San Joaquin, but new facilities would be located entirely on property owned by the San Francisco Public Utilities Commission. All proposed facility improvements would be located adjacent to existing water facilities. Although project facilities would be located in these counties, no approvals are required from them because cities and counties are not required to obtain building or zoning approvals from other cities and counties (pursuant to California Government Code 53090 et seq.). The EIR will further discuss the consistency of relevant elements of the proposed project with the applicable goals, objectives, policies, and plans of the City and County of San Francisco, County of San Mateo, County of Alameda, County of San Joaquin, and any other regional, state, or federal agencies with jurisdiction over the project.

B. ENVIRONMENTAL EFFECTS

All items on the Initial Study checklist have been checked "No," except for items regarding visual quality, biological resources, geology, water quality, hazards, and cultural resources. For items checked "No," staff has determined that the proposed project could not have a significant adverse effect. For items checked "Yes" or "To Be Determined," the analysis will be conducted in the EIR. Several checklist items have been checked "Discussed," indicating that the text includes discussion of those particular issues. For items checked "No" without discussion, the conclusions regarding potential adverse environmental effects are based on field observation, staff and consultant experience on similar

projects, and standard reference material available within the Planning Department. For each checklist item, the evaluation considers the impact of the project both individually and cumulatively.

1) Land Use. Could the project:	Yes	No	Discussed
(a) Disrupt or divide the physical arrangement of an established community?	___	X	X
(b) Have any substantial impact upon the existing character of the vicinity?	*To be determined*		

The project would involve development of new facilities at four main locations, and there would be a potential for land use impacts at these locations. Since proposed water facilities would be located immediately adjacent to existing water facilities, they would not disrupt or divide the physical arrangement of adjacent communities. Proposed facilities at the Tesla Portal, San Antonio Pump Station, and Harry W. Tracy Water Treatment Plant (WTP) locations would not alter the existing character of their vicinities, since proposed facilities would be located adjacent to existing water facilities. However, construction of the proposed pipeline and contactor facilities near the Pulgas Water Temple could result in temporary impacts on the existing character of the temple. Since the project would intensify existing water facility operations and increase the extent of developed area in these four main facility locations, the EIR will further discuss potential short- and long-term impacts on the land use character in their vicinities. The EIR will identify existing and proposed land uses (including recreational uses) in areas surrounding these four locations, as well as anticipated effects of project construction or operation on neighboring land uses (including recreational facilities such as the Pulgas Water Temple and any other sensitive land uses).

2) Visual Quality. Could the project:	Yes	No	Discussed
(a) Have a substantial, demonstrable negative aesthetic effect?	*"No" at all locations except to be determined at San Antonio and Pulgas*		
(b) Substantially degrade or obstruct any scenic view or vista now observed from public areas?	*"No" at all locations except to be determined at San Antonio and Pulgas*		
(c) Generate obtrusive light or glare substantially impacting other properties?	___	X	X

Tesla Portal. The proposed chlorine storage and feed facility would be located on an undeveloped site adjacent to existing structures at the Tesla Portal facility. The site is located in a remote area and would not be visible from any public viewpoints. Adjacent areas are undeveloped. Distant views of the proposed building could be available from Interstate 580 (I-580) and residential areas to the east. However, at these distances (approximately one-half mile), the proposed building would likely blend in with existing buildings at the Tesla Portal facility. Since no visual impacts would result, the EIR visual analysis will not include further discussion of this proposed facility.

San Antonio Pump Station. The proposed ammonia and chlorine feed facility would be visible from Calaveras Road, which is designated by Alameda County as a scenic route. However, the proposed building would be located adjacent to the existing San Antonio Pump Station building and associated facilities, which are currently visible from this road. Furthermore, the proposed site is highly disturbed and littered with debris, and the site is surrounded by mining, nursery, and other industrial/commercial uses. These factors currently degrade the visual character of the site; nonetheless, the EIR will examine the potential degradation of views from any nearby recreational uses and from Calaveras Road.

Proposed dechlorination systems at the Alameda East shaft and possibly the Alameda West shaft would not result in any significant change in scenic views. Since proposed facilities at the Alameda East shaft may be located within an existing structure or adjacent to existing SFPUC facilities, no change in existing views would result from the project. If new facilities are required at the Alameda West shaft, they would be located within an existing valve house or a new building adjacent to it. No change in scenic views or existing visual character would occur if proposed facilities are located within the existing valve house; if a new building is needed, it would be located one-quarter mile west of Calaveras Road, and at this distance would not substantially alter the existing visual character or degrade scenic views. Also, since the new building would be adjacent to existing water facilities and buildings, there would be no substantial change in the visual character. Since no visual impacts would occur, the EIR visual analysis will not include further discussion of these facilities.

Pulgas Water Temple. The proposed dechloramination facility would be visible from Cañada Road and from the public parking lot associated with the Pulgas Water Temple. The proposed site is located in a generally undeveloped area near the Crystal Springs Reservoir. Cañada Road and the Pulgas Water Temple attract pedestrians and bicyclists as well as motorists throughout the year. There could be a temporary degradation of scenic views during construction of proposed pipelines and possible concrete basin that would extend between the dechloramination facility site and the Water Temple. The 20-foot-wide construction corridor near the temple would have an open trench, stockpiled soil, and construction vehicles/equipment and could temporarily degrade the visual character of the Pulgas Water Temple vicinity.

The EIR will describe the existing visual environment for proposed project facilities at the Pulgas site, identify potentially sensitive viewpoints of this site, and present photosimulations of the proposed dechloramination facility from these viewpoints.

The Pulgas Balancing Reservoir is only slightly visible to the public. Proposed reservoir upgrades at the Pulgas Balancing Reservoir would consist of interior piping only. Although there could be a temporary degradation of aesthetics due to the presence of construction equipment and materials, no permanent or long-term changes in scenic views or visual character would result from this proposed improvement. Therefore, no further discussion of this improvement will be included in the EIR visual analysis.

Harry W. Tracy WTP. Development of the proposed ammonia feed system would not degrade or obstruct scenic views or have a substantial negative aesthetic effect, since the building enclosing the proposed system would not be visible from public vantage points. The proposed site would be located adjacent to an existing building, which is not visible from surrounding areas, and the proposed building

likewise would not be visible from any public vantage points. One alternative site for the proposed building is approximately 100 feet to the north of the proposed site. Although residences on Crestview Drive are as close as approximately 400 feet to the east, a hill between the alternative site and these residences would block views of the proposed building from the residences. Therefore, the proposed building would not degrade or obstruct scenic views or have a substantial negative aesthetic effect on these residences from this location. The EIR will not further discuss the visual quality impacts at the Harry W. Tracy WTP, since the proposed building would not degrade or obstruct scenic views or have a substantial negative aesthetic effect.

3) Population. Could the project:	Yes	No	Discussed
(a) Induce substantial growth or concentration of population?	____	X	X
(b) Displace a large number of people (involving either housing or employment)?	____	X	X
(c) Create a substantial demand for additional housing in San Francisco, or substantially reduce the housing supply?	____	X	X

Implementation of the proposed project (including development of the four main facility locations as well as CDD and BAWUA agencies' improvements) are not expected to generate substantial new population, since proposed changes would not expand the overall capacity of the system. However, the EIR will further discuss the project's growth-inducement potential and provide a more detailed evaluation of the growth potential associated with each aspect of the proposed project.

Project implementation would not displace existing housing or businesses. All proposed SFPUC facilities would be located on lands owned by the SFPUC (which are either already developed with water facilities or are undeveloped) or within existing SFPUC, CDD, or BAWUA agencies' facilities. Some short-term jobs would be created as a result of project construction. Initial operation and maintenance may require staffing hours equivalent to approximately 21 additional staff people throughout the SFPUC system, while long-term project operation and maintenance would require staffing hours equivalent to approximately four to six additional staff people throughout the system (including the CDD system). Since most of these staffing hours would be required throughout the SFPUC system and would not be specific to one location, prospective employees could reside in the Bay Area as well as residential areas to the east, in the vicinity of the SFPUC water supply system. Such a wide geographic distribution would allow new residents to be accommodated without substantially decreasing the available housing supply in those communities. Additional staffing hours associated with operation and maintenance of required new facilities within the BAWUA member agencies' system are expected to be substantially less than the SFPUC system estimates and would not cause a significant effect. Since no population, housing, or employment impacts would result from this project, the EIR will not include further discussion of these topics.

4) Transportation/Circulation. Could the project:	Yes	No	Discussed
(a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system?		X	X
(b) Interfere with existing transportation systems, causing substantial alterations to circulation patterns or major traffic hazards?	*"No" at all locations except to be determined at Pulgas*		
(c) Cause a substantial increase in transit demand which cannot be accommodated by existing or proposed transit capacity?		X	
(d) Cause a substantial increase in parking demand which cannot be accommodated by existing parking facilities?		X	X

Tesla Portal. Access to the project site is provided by Vernalis Road, an existing two-lane roadway that extends between Chrisman Road and the project site along the west side of I-580.

The proposed project would result in temporary increases in truck and vehicular traffic due to construction-related material and equipment deliveries and construction-worker access. Construction-related traffic increases in the project vicinity would occur primarily on Chrisman and Vernalis roads, and daily increases would not be substantial due to the limited extent of new construction. Since these roadways carry relatively low traffic volumes, primarily serving the residential area and golf course to the east, increases in material deliveries during construction would not substantially increase traffic in the project vicinity (relative to road capacity). The level of construction traffic would not be substantial and thus would not be expected to significantly increase the potential for safety hazards. Therefore, the EIR will not include further discussion of construction traffic associated with this facility.

No increase in operational vehicular traffic would occur with the project. Operation of the project would not alter staffing requirements at the existing facility and would not increase operational employee trips. At present, there are three to five deliveries per week under average flow conditions and eight to ten deliveries per week under maximum flow conditions (which occurs approximately three to four months out of the year, typically during summer months). Such delivery rates generate an average of two truck trips (one-way) per day under average flow conditions and up to four truck trips (one-way) per day under maximum flows.[4] The project would not increase chemical deliveries to this facility. Therefore, the EIR will not include further discussion of operational truck traffic associated with this facility.

There is adequate open area within and around the Tesla Portal facility to provide sufficient parking for construction-related trucks and vehicles. The proposed chlorine storage and feed facility is proposed to be designed with sufficient parking for chemical delivery trucks and employee vehicles.

4 Truck traffic volumes assume one chemical delivery generates two one-way truck trips (one inbound trip and one outbound trip). It is also assumed that chemical deliveries only occur on weekdays, and therefore, the number of weekly deliveries is averaged over five days to derive the average daily traffic volume.

San Antonio Pump Station. Access to the project site is provided by Calaveras Road, an existing two-lane roadway that extends between I-680 and the project site. Traffic generated by project construction and operation would use Calaveras Road between the site and I-680.

The proposed project would result in temporary increases in truck and vehicular traffic due to construction-related material and equipment deliveries and construction-worker access at the San Antonio Pump Station site as well as the Alameda East and West shafts sites. Construction-related traffic increases in the site vicinities would temporarily occur on Calaveras Road, and daily increases would not be substantial due to the limited extent of new construction. Since Calaveras Road carries relatively low traffic volumes, primarily providing access to commercial and recreational uses to the south, traffic generated by project construction would not substantially increase traffic in the site vicinities (relative to road capacity). The level of construction traffic would not be substantial and thus would not be expected to significantly increase the potential for safety hazards. Therefore, the EIR will not include further discussion of construction traffic associated with this facility.

Operation of the project would require additional staffing hours equivalent to one staff person at this facility. At present, chemical deliveries to the San Antonio Pump Station occur approximately two to three times per year. There are no chemicals stored at the Alameda West site, and chemicals needed at the Alameda East site are delivered to the San Antonio Pump Station site. After project implementation, there would be four to five deliveries per week under average flow conditions and eight to nine deliveries per week under maximum flow conditions (which occurs approximately three to four months out of the year, typically during summer months). Such delivery rates would generate an average of two truck trips (one-way) per day under average flow conditions and up to four truck trips (one-way) per day under maximum flows. The project would result in an average net increase of up to two truck trips per day under average flows and up to four truck trips per day under maximum flow conditions. Since Calaveras Road carries relatively low traffic volumes, traffic generated by project operation would not substantially increase traffic in the project vicinity (relative to road capacity). The level of operational traffic would not be substantial and thus would not be expected to significantly increase the potential for safety hazards. Therefore, the EIR will not include further discussion of operational traffic associated with this facility.

There is adequate open area within and around the existing San Antonio Pump Station facility to provide sufficient parking for construction-related trucks and vehicles. The proposed ammonia and chlorine feed system facility is proposed to be designed with sufficient parking for chemical delivery trucks and employee vehicles.

Pulgas Water Temple. Access to the project site is provided by Cañada Road, an existing two-lane roadway that extends between two I-280 interchanges, one to the north at Highway 92 and one to the south at Edgewood Road.

Traffic generated by project construction would result in traffic increases on Cañada Road between the site and I-280. Project construction would also include a pipeline crossing under Cañada Road from the boosting station to the balancing reservoir. The project would generate new truck traffic due to construction-related material and equipment deliveries. Workers accessing the site would also generate

additional vehicular traffic during construction. Temporary partial or full closure of Cañada Road would be required as part of pipeline construction. Pulgas Water Temple and Cañada Road are used by recreationists, and special events (e.g., weddings) are frequently held at the Water Temple. Construction-related traffic increases associated with the proposed dechloramination facility and Pulgas Balancing Reservoir improvements could conflict with traffic associated with recreational uses and special events at the Pulgas Water Temple. The EIR will further discuss potential conflicts associated with increased construction-related truck traffic increases on Cañada Road and the site vicinity.

Project-related operational traffic would access the site via Cañada Road, where there are currently no chemical deliveries and limited employee traffic. Operation of the project would require additional staffing hours equivalent to less than one staff person at this facility. After project implementation, the proposed facility would require an average of two to five deliveries per week under average flow conditions and 12 to 14 deliveries per week under maximum flows (which occurs approximately three to four months out of the year, typically during summer months). Such delivery rates would generate an average of two truck trips (one-way) per day under average flow conditions and up to six truck trips (one-way) per day under maximum flows. Such increases would not substantially increase traffic on Cañada Road (relative to road capacity).

There is adequate open area within and around the project site (including the overflow parking lot at Pulgas Water Temple) to provide sufficient parking for construction-related trucks and vehicles. The proposed dechloramination facility is proposed to be designed with sufficient parking for chemical delivery trucks and employee vehicles.

<u>Harry W. Tracy WTP</u>. The project would generate new truck traffic due to construction-related material and equipment deliveries and operational truck traffic associated with chemical deliveries. Workers accessing the site would also generate additional vehicular traffic during construction. Construction-related daily traffic increases would not be substantial due to the limited extent of new construction. The project would increase staffing hours at this existing facility equivalent to less than one additional staff person, which would likely be absorbed by existing staff. Project-related traffic would access the site via Crystal Springs Road, consistent with current chemical delivery and employee access routes. At present, there are an average of four chemical deliveries per week, which generates an average of two truck trips per day. The project would result in an average of two additional deliveries per week during average flows and three additional deliveries per week during maximum flow conditions (which occurs approximately three to four months out of the year, typically during summer months). Additional deliveries would generate an average of one additional truck trip (one-way) per day under average and maximum flow conditions. Such increases would not substantially increase traffic on Crystal Springs Road (relative to road capacity). The level of construction-related and operational traffic would not be substantial and thus would not be expected to significantly increase the potential for safety hazards. Therefore, the EIR will not include further discussion of construction or operational traffic associated with this facility.

The project site is adjacent to the WTP's existing parking lot, and there is limited additional open area in the site vicinity to accommodate any substantial increase in parking demand by construction-related trucks and vehicles. However, there is adequate area within the WTP facility area to accommodate the

project's construction-related parking demand. Construction parking and staging areas would be designated and located away from existing residences. The proposed ammonia and chlorine feed facility would be designed with sufficient parking for chemical delivery trucks and employee vehicles.

CDD System. Since long-term project operation and maintenance would require staffing hours equivalent to approximately four to six additional staff people throughout the SFPUC system (including the CDD system), project-related operational traffic increases at CDD facilities would be less than significant. Initial cleaning of CDD reservoirs would require staffing hours equivalent to approximately seven additional staff people. Such an increase in staff would be temporary (limited to the cleaning operation) and distributed over the various CDD reservoirs. Therefore, additional staff requirements associated with initial and long-term operation of CDD improvements would result in less-than-significant traffic increases.

5) Noise. Could the project:	Yes	No	Discussed
(a) Increase substantially the ambient noise levels for adjoining areas?	*"No" at all locations except to be determined at Pulgas*		
(b) Violate Title 24 Noise Insulation Standards, if applicable?		n/a	
(c) Be substantially impacted by existing noise levels?		X	

Tesla Portal. Areas adjacent to the proposed chlorine storage and feed facility site are currently undeveloped, except for existing water-related facilities. There is a residential area approximately one-half mile to the east. The ambient noise environment in this area is dominated by I-580, which is immediately to the northeast. The access road to the project site, Vernalis Road, is located as close as 50 to 100 feet from those residences that are closest to the freeway.

Project implementation would have the potential to generate noise during construction and operation. However, due to the one-half-mile separation between residences and the site, on-site operational or construction noise would not substantially increase ambient noise levels at existing residences. Noise levels of 75 to 85 A-weighted decibels (dBA) at 50 feet are typically generated by earthmoving equipment. The one-half-mile separation would reduce such noise levels to 41 to 51 dBA, which would be at or below typical daytime ambient noise levels characteristic of most residential environments located near a freeway such as I-580.

Operation of the proposed storage and feed facility would generate low levels of noise associated with pumps and interior alarms. Alarms would be low-decibel or visual alarms and would only be audible inside the building. Since noise-generation potential would depend on the size of the pumps, the maximum possible noise level that could be generated by pumps would be 85 dBA (Leq)[5] at 50 feet.[6]

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5 Leq: Equivalent energy noise level, which is the average acoustic energy content of time-varying noise during the measurement period.

6 It should be noted that chemical pumps are anticipated to be small pumps, generating low noise levels similar to a photocopier.

Since pumps (along with the entire storage and feed system) would be enclosed within a building, pump noise would be reduced by 15 to 40 dBA, depending on the building design. When noise reductions due to the intervening distance and the proposed building enclosure are considered, project-related operational noise levels would be 35 dBA or less at the closest residences. Such levels would be at or below typical daytime or nighttime ambient noise levels characteristic of most residential environments located near a freeway such as I-580. Standby power for the facility would likely be provided by an emergency diesel- or propane-powered generator. The emergency generator would be used infrequently and enclosed within the facility building or in an adjacent free-standing enclosure, reducing the potential for long-term noise impacts. Therefore, construction-related and operational facility noise would not substantially increase ambient noise levels, and the EIR will not include any further discussion of construction or operational noise at this facility.

Traffic-generated noise increases would also result from project construction and operation. The project would generate new truck traffic due to construction-related material and equipment deliveries and operational truck traffic associated with chemical deliveries. Workers accessing the site would also generate additional vehicular traffic during construction. Project-related traffic would access the site via Vernalis Road, which extends along the southwest side of I-580, west of Chrisman Road. Just west of Chrisman Road, existing homes are located within 50 to 100 feet of Vernalis Road. Due to the already high ambient noise levels associated with I-580 in this area, the small increase in construction-related worker vehicular traffic on this road would not substantially increase ambient noise levels. Temporary noise increases resulting from construction-related truck trips could be noticeable but would not substantially increase ambient noise levels or affect residential receptors, since these increases would occur only during the daytime hours for a limited duration. Project operation would not alter staffing requirements at the existing facility, and there would be no increase in operational employee trips or chemical deliveries. Therefore, the EIR will not include further discussion of construction or operational traffic noise associated with this facility.

<u>San Antonio Pump Station</u>. The proposed ammonia and chlorine feed facility would be located in an undeveloped area adjacent to the existing San Antonio Pump Station. Areas adjacent to the project site are developed with water facilities or industrial uses (quarries, nurseries, recycling plant, etc.). The Environmental Health and Safety section of the Alameda *East County Area Plan*[7] identifies noise-sensitive land uses as residential development, mobile-home parks, schools, libraries, churches, hospitals, nursing and convalescent homes, and some parks and cultural facilities. There are no such noise-sensitive receptors in the project vicinity. The ambient noise environment in this area is dominated by traffic on Calaveras Road and equipment operation at the nearby industrial and mining uses and the adjacent San Antonio Pump Station.

Project implementation would have the potential to generate noise in the site vicinity during facility construction and operation. However, since no noise-sensitive receptors would be adversely affected, potential noise increases associated with the project would not have a significant impact. Traffic-generated noise increases associated with project construction and operation would occur primarily along

7 County of Alameda, Planning Department, *East County Area Plan, Volume 1: Goals, Policies and Programs,* Adopted May 5, 1994 (corrected March 1996).

Calaveras Road between the site and I-680. Again, since there are no noise-sensitive receptors located along this road (south of the freeway), traffic noise increases would not have a significant impact. Therefore, the EIR will not include further discussion of construction or operational noise at this facility.

Pulgas Water Temple. The proposed dechloramination facility would be located in an undeveloped area immediately south of the Pulgas Water Temple and west of Cañada Road. I-680 is approximately one-half mile to the east. The Filoli Estate, a 654-acre private landholding, is approximately 4,200 feet (0.8 mile) to the south. The Filoli Estate, which is open to the public, includes one historic residence, gardens, and nature trails.

The Man-Made Hazards section of the San Mateo County General Plan[8] defines noise-sensitive land uses as "land uses most sensitive to noise intrusion, including, but not limited to, residential and the following institutional uses: hospitals, schools and libraries." Although recreational uses are not specifically identified as noise-sensitive, the Pulgas Water Temple could be considered noise-sensitive, given the nature of its use for special events (e.g., weddings). No other noise-sensitive receptors exist within the vicinities of the proposed dechloramination facility site or the Pulgas Balancing Reservoir site. The closest residential uses are over one mile to the east of the facility, and east of I-280. The EIR will further discuss potential noise impacts associated with construction and operation of the proposed project.

Harry W. Tracy WTP. Development of the proposed ammonia feed facility would have the potential to generate noise during construction and operation. There are existing residences as close as approximately 500 feet to the southeast and 1,000 feet to the east. Existing topographical features to the southeast and east currently block direct lines-of sight and provide noise attenuation between the project site and these residences. The ambient noise environment in this area is dominated by I-280, which is immediately west of the site and the residential area to the southeast.

Construction noise levels of 75 to 85 dBA at 50 feet are typically generated by earthmoving equipment. The combined attenuation provided by distance and topography would reduce such noise levels to 45 to 57 dBA, which would be at or below typical daytime ambient noise levels characteristic of most residential environments located adjacent to a freeway such as I-280. The project would not substantially increase ambient noise levels during construction. Therefore, the EIR will not include further discussion of construction noise at this facility.

Operation of the proposed ammonia feed system would generate low levels of noise associated with pumps and interior alarms. Alarms would be low-decibel or visual alarms and would only be audible inside the building. Since noise-generation potential would depend on the size of the pumps, the maximum possible noise level that could be generated by pumps would be 85 dBA (Leq) at 50 feet.[9] Since pumps associated with the feed system would be enclosed within a building, pump noise would be reduced by 15 to 40 dBA, depending on the building design. When noise reductions from topography,

8 County of San Mateo, Department of Environmental Management, *General Plan for San Mateo County, Man-Made Hazards Background,* November 1986.

9 It should be noted that chemical pumps are anticipated to be small pumps, generating low noise levels similar to a photocopier.

the intervening distance, and the proposed building enclosure are considered, project-related operational noise levels are expected to be 42 dBA or less at residences, which would be at or below typical daytime and nighttime ambient noise levels characteristic of most residential environments located adjacent to or near a freeway such as I-280. In addition, standby power for the facility would likely be provided by the existing emergency generator at this facility. Project operation would not substantially increase ambient noise levels, and thus the EIR will not include further discussion of operational noise at this facility.

Traffic-generated noise increases would also result from project construction and operation. The project would generate new truck traffic due to construction-related material and equipment deliveries and operational truck traffic associated with chemical deliveries. Workers accessing the site would also generate vehicular traffic during construction. The project would not alter staffing requirements at the existing facility, and there would be no increase in employee trips.

Project-related traffic would access the site via Crystal Springs Road along current chemical delivery access routes. Although residential uses are located along this roadway, ambient noise levels in this area are already relatively high due to traffic on Crystal Springs Road and I-280. Project-related traffic would have to nearly double existing traffic levels on this roadway to result in a noticeable noise increase. Therefore, the relatively small increase in worker vehicular traffic on this road during construction would not substantially increase ambient noise levels. Temporary noise increases resulting from construction-related truck trips could be noticeable at some residences but would not substantially increase ambient noise levels or affect residential receptors, since these increases would occur only during the daytime hours and for a limited duration. With respect to increased chemical deliveries, it is anticipated that truck deliveries would increase by less than one truck delivery per day. Such a small traffic increase would not substantially alter ambient noise levels. The EIR will not include further discussion of construction or operational traffic noise associated with this facility.

6) Air Quality/Climate. Could the project:	Yes	No	Discussed
(a) Violate any ambient air quality standard or contribute substantially to an existing or projected air quality violation?	___	X	X
(b) Expose sensitive receptors to substantial pollutant concentrations?	___	X	X
(c) Permeate its vicinity with objectionable odors?	___	X	X
(d) Alter wind, moisture or temperature (including sun shading effects) so as to substantially affect public areas, or change the climate either in the community or region?	___	X	X

Project-related construction activities at the Tesla Portal, San Antonio Pump Station, Pulgas Water Temple, and Harry W. Tracy WTP locations would generate dust and construction-equipment exhaust emissions. However, construction activities would not generate substantial air pollutants or violate ambient air quality standards at the four facility locations if standard emission-control measures, as specified by the Bay Area Air Quality Management District (BAAQMD), are implemented. The

BAAQMD considers project-related construction emissions to be mitigated to a less-than-significant level with implementation of these standard measures. These measures will be incorporated into the proposed project as construction specifications and are as follows:

- Water all active construction sites at least twice daily, and more often on days when winds exceed 10 to 15 miles per hour.
- Cover all trucks hauling soil, sand, and other loose materials *or* maintain at least 2 feet of freeboard in trucks hauling such materials.
- Pave, apply water three times daily, or apply nontoxic soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.
- Using water sweepers, sweep all paved access roads, parking areas, and staging areas at construction sites on a daily basis.
- Using water sweepers, sweep streets adjacent to construction sites daily if visible soil material is carried onto adjacent public streets.

For construction areas involving disturbance of more than four acres, the following enhanced control measures will be implemented:

- Hydroseed or apply nontoxic soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more).
- Enclose, cover, water twice daily, or apply nontoxic soil binders to exposed stockpiles (dirt, sand, etc.).
- Limit traffic speeds on unpaved roads to 15 miles per hour.
- Install sandbags or other erosion-control measures to prevent silt runoff to public roadways.
- Replant vegetation in disturbed areas as quickly as possible.

Project operation would generate air pollutant emissions associated with traffic generated by new employees and chemical deliveries. Since additional staffing hours associated with project operation would result in minimal daily traffic increases throughout the SFPUC system, traffic-related air emissions would not substantially increase local or regional emissions. Also, truck exhaust emissions generated by increased chemical deliveries would not be expected to violate any ambient air quality standards, since chemical deliveries to the four facilities would not increase substantially on a daily basis.

Water treatment-related facilities have generally not been associated with air pollution emissions that have state and federal standards, or those that might cause a localized nuisance due to odor, fumes, mist, etc. Operation of the proposed ammonia and chlorine feed systems at Tesla Portal, San Antonio Pump Station, and Harry W. Tracy WTP as well as the dechloramination facility at Pulgas Water Temple would involve increased chemical storage and usage at these locations. The potential for accidental release of treatment chemicals is discussed in checklist item 12, Hazards. Other than accidental releases, proposed facilities would not produce direct air emissions. Standby power for these facilities would likely be provided by emergency diesel- or propane-powered generators. Emergency power at Harry W. Tracy WTP would be provided by the existing emergency generator at this facility. Since the proposed

generators would be stationary-point sources, they would be subject to review by the BAAQMD to determine if an Authority to Construct permit and a Permit to Operate are required. The permit review process would ensure that air emissions associated with the facility comply with applicable BAAQMD standards. The EIR will not include further discussion of construction or operational air quality impacts associated with these facilities, since implementation of Mitigation Measure 1 and the BAAQMD permit review requirements would reduce potential air quality impacts to a less-than-significant level.

Operation of the proposed ammonia and chlorine feed systems at Tesla Portal, San Antonio Pump Station, and Harry W. Tracy WTP as well as the dechloramination facility at Pulgas Water Temple would involve the use of chemicals for disinfection. There would be a potential for odor impacts in proximity to areas where the concentrated chemicals are stored or transferred. However, all contact points between the atmosphere and chemical storage and feed facilities are sealed or vented to minimize odor potential. Potential odor impacts associated with accidental releases are discussed below under checklist item 12, Hazards. The use of chlorine and ammonia for disinfection could result in changes to the taste and odor of treated water, and the EIR will address these changes in the Public Health and Water Supply section.

7) Utilities/Public Services. Could the project:	Yes	No	Discussed
(a) Breach published national, state, or local standards relating to solid waste or litter control?		X	X
(b) Extend a sewer trunk line with capacity to serve new development?		X	X
(c) Substantially increase demand for schools, recreation or other public facilities?		X	X
(d) Require major expansion of power, water, or communication facilities?		X	X

Construction and operation of the project facilities would not breach published national, state, or local standards relating to solid waste or litter control; extend a sewer trunk line with capacity to serve new development; increase demand for schools, recreation, or other public facilities; or require major expansion of power, water, or communication facilities. On-site utilities are available at the four main facility locations and include gas, water, electrical, sewer/septic, and storm drains. The Alameda West shaft has gas, water, and electrical utilities only.[10] Construction of the project facilities could potentially interfere with other existing utilities and public services. During construction, there would be a potential for temporary disruptions in utilities or emergency response delays in areas located immediately adjacent to proposed facilities. However, the SFPUC will coordinate its planning and design efforts with affected utilities and notify emergency providers. Such measures will reduce potential service disruption impacts to a less-than-significant level.

10 San Francisco Water Team, *Chloramine Conceptual Design Report*, 1999. Appendix A.4.1.

8) Biology. Could the project:

	Yes	No	Discussed
(a) Substantially affect a rare or endangered species of animal or plant or the habitat of the species?	*"No" at Tracy WTP; to be determined at other facility locations*		
(b) Substantially diminish habitat for fish, wildlife or plants, or interfere substantially with the movement of any migratory fish or wildlife species?	*"No" at Tracy WTP; to be determined at other facility locations*		
(c) Require removal of substantial numbers of mature, scenic trees?	*"No" at Tracy WTP; to be determined at other facility locations*		

Tesla Portal. The proposed chlorine storage and feed facility would be located on an undeveloped site adjacent to existing structures at the Tesla Portal facility. Preliminary surveys indicate that a wetland is located on the site. The EIR will examine this wetland further to determine (1) the source of water supporting this wetland, (2) its biological quality and importance, and (3) whether it is under the jurisdiction of the U.S. Army Corps of Engineers. The EIR will also assess potential impacts on any other biological resources located on the site.

San Antonio Pump Station. The proposed ammonia and chlorine feed facility would be located in a floodplain area located adjacent to the existing San Antonio Pump Station. Preliminary surveys indicate that a potential jurisdictional wetland is located on the site. The EIR will examine this wetland further to determine (1) the source of water supporting this wetland, (2) its biological quality and importance, and (3) whether it is under the jurisdiction of the U.S. Army Corps of Engineers. The EIR will also assess potential impacts on any other biological resources located on the San Antonio Pump Station site as well as on the Alameda East and West shafts sites.

Pulgas Water Temple. The proposed dechloramination facility would be located in an area near a known habitat for special-status species (e.g., California red-legged frog and San Francisco garter snake) or could contain jurisdictional wetlands. Construction of proposed pipelines that would extend between the dechloramination facility site and the Water Temple would require tree removal; construction of the contactor pipeline or basin could also traverse areas containing sensitive biological resources. Although proposed reservoir upgrades at the Pulgas Balancing Reservoir would consist of interior piping only, any temporary surface disturbance resulting from construction activities (e.g., staging areas) would have the potential to adversely affect sensitive biological resources, if they are present. The EIR will confirm the presence or absence of sensitive habitats, special-status species, and jurisdictional wetlands in the affected area. In addition, the EIR analysis will examine potential conflicts with the San Mateo County Tree Ordinance (if applicable) and adopted and proposed policies of the Peninsula Watershed Management Plan, which both protect wetlands, riparian habitats, and ecologically sensitive habitats (including special-status species and their habitats).

Although the dechloramination facility would remove chlorine and reduce ammonia levels, the resulting discharge to Crystal Springs Reservoir would contain minor increases in ammonia. Since ammonia at higher concentrations can be toxic to aquatic life and can result in algal blooms, the EIR will discuss the potential effects associated with ammonia discharges into Crystal Springs Reservoir. In addition, in the

event of upset and failure of the proposed dechloramination facility, there could be adverse effects on aquatic resources and water quality due to discharges into the reservoir. The EIR analysis will address potential impacts on aquatic habitat in the event of an accidental discharge of chloraminated water compared to chlorinated water.

Proposed upgrades at the Pulgas Balancing Reservoir would consist of interior piping only. The EIR will examine potential impacts on biological resources that could result from construction-related activities associated with surface disturbance or tree removal.

Harry W. Tracy WTP. Preliminary surveys indicate that there are no sensitive biological resources at the proposed site of the ammonia feed system. The site is adjacent to an existing building and paved parking lot and is covered mostly with landscape species and invasive plant species (i.e., French Broom *[Genisia monspessulana]* and purple star thistle *[Centaurea calcitrapa])*. Ground disturbance could result in the spread of these invasive plants, but given the lack of sensitive biological resources on this site, the EIR will not further discuss biological impacts at the Harry W. Tracy WTP.

Secondary Discharges. The EIR analysis will address potential program-level impacts on aquatic habitats that could result from any accidental or inadvertent secondary discharges of chloraminated instead of chlorinated water in the event of failure of a proposed dechlorination facility.

9) Geology/Topography. Could the project:	Yes	No	Discussed
(a) Expose people or structures to major geologic hazards (slides, subsidence, erosion, and liquefaction)?	*To be determined*		
(b) Change substantially the topography or any unique geologic or physical features of the site?	*To be determined*		

Tesla Portal. The San Joaquin thrust fault is located beneath the Tesla area and may be capable of producing seismic warping across an area about 250 feet wide. Proposed facilities would be located within the zone of potential ground warpage during a major earthquake along this fault. The subsurface soils at this site consist of sandy clays, sandy gravels, and sand. These conditions are considered adequate to support the facilities with the use of shallow foundations.[11] The EIR will further discuss potential seismic hazards associated with this facility.

San Antonio Pump Station. The proposed ammonia and chlorine feed facility would be within the Alquist-Priolo Special Studies Zone, about 1,300 feet from the mapped trace of the Calaveras fault. The Calaveras fault system is a major branch of the San Andreas system in Northern California, splitting from the San Andreas a few miles south of Hollister and extending approximately 80 miles northeast to an area just north of Danville. Historically, a number of earthquakes have occurred along the Calaveras fault, including the 1984 Morgan Hill event (6.2 moment magnitude). It has been estimated that the

[11] San Francisco Water Team, *Chloramine Conceptual Design Report*, 1999.

Calaveras North fault is capable of producing a 6.8 moment magnitude earthquake.[12] Given the high level of historic activity on the Calaveras fault and the proximity of the proposed facilities to the fault, the potential exists for fault rupture and strong groundshaking in the event of an earthquake. A systematic drilling program was conducted to locate the limits of the Calaveras fault in the project vicinity and the program indicated that the fault trace is likely located to the west of the San Antonio Pump Station, possibly encroaching into the proposed location of the feed facility site. Therefore, a limited fault trenching program is currently underway to determine if the fault is located on the site.

The shallow soils at the site consist of silty clay and silty sand to a depth of about 18 feet, where geotechnical investigations encountered bedrock beneath most of the site. It is suspected that the bedrock may plunge to greater depths beneath the western portion of the site. The geologic materials are generally adequate to support a shallow foundation, although the possible change in bedrock depth may influence foundation design.[13] The EIR will further discuss the project's potential seismic and geotechnical impacts and provide mitigation measures for any such impacts. The EIR will also examine the project's potential geotechnical impacts and provide appropriate mitigation measures for the vicinities of the Alameda East and West shafts, which are also located in proximity to the Calaveras fault.

<u>Pulgas Water Temple</u>. The proposed dechloramination facility would be located on the border of the Alquist-Priolo Special Studies Zone, within about 2,200 feet of the San Andreas fault system, which is a major feature of California tectonics and is responsible for most of California's largest earthquakes. The 1906 San Francisco earthquake (7.8 moment magnitude) occurred along this fault system. The San Andreas fault forms a rift valley in which Upper and Lower Crystal Springs reservoirs are situated, and this fault intersects an abutment of San Andreas Reservoir (both Lower Crystal Springs and San Andreas dams existed in 1906, but neither were seriously damaged). A secondary trace of the San Andreas fault, the Cañada fault, is mapped about 900 feet southwest of the proposed construction site. The risk of fault rupture is low at this site, although strong groundshaking could occur in the event of an earthquake.[14] Development of this facility would require substantial grading for pipelines, basins and other facilities, resulting in topographic changes that would increase the potential for geotechnical hazards (including erosion). The EIR will further discuss the potential for seismic and geotechnical hazards associated with this facility.

The Pulgas Balancing Reservoir is also located in proximity to the San Andreas fault system. Although proposed reservoir upgrades would consist of interior piping only, the EIR will examine the potential seismic and geotechnical hazards at this location.

<u>Harry W. Tracy WTP</u>. The proposed ammonia feed facility would be located in proximity to the San Andreas fault system, which is described above under the Pulgas Water Temple. The site is located on a hillside adjacent to existing buildings and a paved parking lot. Substantial excavation would be required

12 The Water Reliability Partnership, *SFPUC Facilities Reliability Program, Phase II – Regional System Overview, Technical Memorandum No. 1, Hazard Events and Maps*, April 27, 1999. This report is on file at the San Francisco Planning Department, 1660 Mission Street, in File No. 98.898E.

13 San Francisco Water Team, *Chloramine Conceptual Design Report*, 1999.

14 San Francisco Water Team, *Chloramine Conceptual Design Report*, 1999.

to develop the proposed building, increasing the potential for geotechnical hazards (including erosion). The EIR will further discuss the potential seismic and geotechnical hazards associated with this facility.

10) Water. Could the project:	Yes	No	Discussed
(a) Substantially degrade water quality, or contaminate a public water supply?	*To be determined*		
(b) Substantially degrade or deplete groundwater resources, or interfere substantially with groundwater recharge?		X	
(c) Cause substantial flooding, erosion, or siltation?	*To be determined*		

Water Quality and Hydrology

Tesla Portal. The proposed chlorine storage and feed facility would be located on an undeveloped site, and it is anticipated that considerable grading would be needed. Construction of the proposed facility at this location would have the potential to degrade downstream surface water quality, and general stormwater pollution-control measures would need to be implemented. Long-term operation of the facility may result in water quality or hydrological impacts due to increases in impervious surfaces associated with proposed improvements. The EIR will examine the potential water quality and hydrological impacts that could result from construction-related activities associated with grading and long-term increases in impervious surfaces.

San Antonio Pump Station. The proposed ammonia and chlorine feed facility would be located in a floodplain area adjacent to the existing San Antonio Pump Station. Development of this facility would involve placement of a substantial amount of fill to raise the building pad above this floodplain area. Given the site's upstream location from Alameda Creek and proposed placement of fill, there would be potential for degradation of downstream surface water quality in Alameda Creek (e.g., siltation during construction and accidental release of chloraminated water during operation) and changes in drainage (i.e., downstream flood hazards). Proposed improvements at the Alameda East and West shafts are also located upstream of Alameda Creek. Therefore, the EIR will further discuss the potential for water quality and hydrologic impacts on Alameda Creek or any downstream uses.

Pulgas Water Temple. The proposed dechloramination facility would be located on a gently sloping hillside upstream of Crystal Springs Reservoir. Construction of the facility at this location would have the potential to degrade downstream surface water quality, and construction of several thousand linear feet of various pipelines and possibly a basin contactor system upstream of the reservoir would have the potential for sedimentation impacts. General stormwater pollution-control measures would need to be implemented. The EIR will examine the potential water quality and hydrological impacts that could result from construction-related activities associated with grading and other earthmoving activities.

Project operation would prevent discharge of chloraminated water into Crystal Springs Reservoir to protect aquatic resources and water quality. Although the dechloramination facility would remove chlorine and reduce ammonia levels, the resulting discharge to Crystal Springs Reservoir would contain

minor increases in ammonia at levels low enough to protect water quality. However, since ammonia at higher concentrations can be toxic to aquatic life and contribute to algal blooms, the EIR will discuss the potential effects associated with ammonia discharges into Crystal Springs Reservoir. In addition, in the event of upset and failure of the proposed dechloramination facility, there could be adverse effects on aquatic resources and water quality due to discharges into the reservoir. The EIR will further discuss potential operational water quality impacts on Crystal Springs Reservoir, including comparison of potential effects of chloraminated discharges with potential effects of chlorinated discharges. The EIR analysis will also examine potential conflicts with adopted and proposed water-protection policies of the Peninsula Watershed Management Plan.

Proposed reservoir upgrades at the Pulgas Balancing Reservoir would include interior piping modifications in the reservoir as well as construction of a buried chemical feed pipeline from the balancing reservoir, crossing under Cañada Road, to the proposed dechloramination facility. The EIR will examine the potential water quality and hydrological impacts that could result from construction-related activities associated with grading.

Harry W. Tracy WTP. The proposed ammonia feed facility would be located on a hillside adjacent to existing buildings and a paved parking lot. Substantial excavation would be required to develop the proposed building, increasing the potential for erosion; general stormwater pollution-control measures would need to be implemented. Project operation could result in the discharge of chlorinated or chloraminated backwash water into the San Andreas Reservoir. The EIR will further discuss potential construction-related erosion hazards and operational water quality impacts on San Andreas Reservoir.

Secondary Discharges. The proposed dechlorination facilities at secondary discharge locations would remove chlorine from chloraminated discharges to surface waters. This would be a beneficial impact to surface water quality compared to existing conditions, where chlorinated water (which is toxic to aquatic life) currently overflows or is incidentally discharged. However, the proposed project would result in minor increases in ammonia, which would not affect surface water quality at the anticipated concentrations, volumes, and pH levels. The potential water quality impacts associated with this minor increase in ammonia levels in secondary discharges will be discussed in more detail in the EIR. In addition, as discussed under the Hazards section, there is a potential that in the event of a facility failure or catastrophic event, chloraminated water could be discharged to surface waters at secondary discharge locations. Chloraminated water can be toxic to aquatic life, and depending on the concentration, volumes, and site conditions, chloraminated discharges could be a significant water quality impact. However, since under existing conditions, chlorinated water is being discharged at these locations, the EIR will compare the potential toxic effects of chlorinated discharges with the potential effects of chloraminated discharges in the event of an upset or system failure (see checklist item 8, Biology, for more discussion).

CDD System. The operational changes to the CDD system required prior to chloramine conversion include cleaning of all the reservoirs. This would entail drawdown of the reservoirs and removal of sediments or deposits in the reservoirs. The EIR will discuss disposal of discharges from reservoir cleaning operations. On a program level, improvements to some chemical feed systems at CDD facilities

would not be expected to result in water quality impacts, since all construction and operational activities would be limited in extent and associated with existing facilities.

BAWUA Member Agencies' Systems. Since the description and location of modifications to BAWUA member agencies' systems is currently unknown, the EIR will discuss program-level water quality impacts associated with general construction activities, potential for secondary discharge impacts (similar to that for the SFPUC system described above), and potential water quality issues associated with blending chloraminated water with other water sources.

Systemwide Discharges. The change in water quality associated with chloramine conversion of the drinking water supply would result in indirect, low-level changes in the water quality of wastewater discharges, combined sewer overflows (CSOs), and non-point source discharges to the Bay. However, as described below, these levels of chloramines would be negligible increases in ammonia and would not contribute to a RWQCB discharge limitation. Therefore, the chloramine conversion would be considered to have a less-than-significant water quality impact on wastewater, CSO and non-point source discharges, and this issue will not be discussed further in the EIR.

Levels of chloramine present in drinking water would be reduced following use by water customers through its reactions with substances in the water, and reduced levels would pass through to the wastewater system. The chloramines would eventually break down to form chlorine and ammonia, and the reactive chlorine portion would volatilize, leaving ammonia. However, wastewater contains a wide variety of chemicals, microorganisms, and other contaminants, including many other sources of ammonia, and ammonia originating from chloramines in drinking water would constitute only a fraction of chemicals in wastewater. Thus, while chloraminated drinking water typically contains levels of ammonia of about 0.3 to 0.5 milligrams per liter (mg/L), treated wastewater under dry weather conditions typically contains much higher levels, about 16 to 26 mg/L ammonia.[15] During wet weather conditions, the ammonia levels in wastewater discharges vary depending on rainfall but overall are lower than during dry weather conditions. Therefore, the maximum level of ammonia in wastewater that could be attributed to chloramine in drinking water would be less than two percent during dry weather and even less during wet weather. This percentage is within the typical range of variation of existing ammonia levels in wastewater discharges. Furthermore, the RWQCB has not imposed permit limitations on ammonia for wastewater discharges in San Francisco. Therefore, the impact of chloramine conversion to ammonia levels in wastewater discharges would be less-than-significant.

With respect to CSOs in San Francisco, the CSO discharges to the Bay consist of wastewater diluted by stormwater runoff, with the extent of dilution varying with the size of the rainstorms. The ammonia levels in CSOs vary depending on rainfall, but on average, the levels range from 4 to 10 mg/L ammonia or about one fourth to one third the concentration in wastewater discharges due to the dilution with stormwater. Therefore, the fraction of ammonia in CSO discharges attributable to chloramines in drinking water would be about half of one percent, and again, within the range of variation of existing

15 Approximate effluent ammonia levels under dry weather conditions for City and County of San Francisco, Southeast and Oceanside Water Pollution Control Plants. Ammonia units expressed as milligrams per liter as nitrogen.

ammonia levels in CSO discharges. Therefore, the impact of chloramine conversion to ammonia levels in CSO discharges would be less-than-significant.

Non-point sources of direct discharges of chloraminated drinking water to the Bay would consist mainly of washing and flushing of piers or boats along the Bay shoreline using SFPUC water that drains directly to the Bay. These sources, however, would be sporadic in nature and of limited volume, occurring only in isolated areas along the Bay shoreline. Runoff from other parts of the City from hosing down driveways or car rinsing with SFPUC water would drain to the combined sewer system and would be discharged either as part of wastewater or CSO discharges discussed above. Since the toxicity of ammonia to aquatic organisms is dependent upon the pH, the impact of direct discharge to the Bay would depend on the pH of the Bay receiving waters. At the typical pH range of the Bay and at the typical concentration range of ammonia in chloraminated water, the toxic fraction of ammonia would be well below the levels considered harmful to aquatic life. Therefore, due to the relatively low volume and sporadic nature of these non-point source discharges and the low toxicity levels due to the pH of receiving waters, the impact of chloramine conversion to ammonia levels in non-point discharges would be less-than-significant.

Public Health and Water Supply

The EIR will discuss the effectiveness of chloramination for disinfection and for reduction of disinfection by-products in the SFPUC drinking water supply. The EIR will also discuss existing drinking water quality and proposed changes in water quality relative to federal and state primary and secondary drinking water standards and maximum contaminant levels. Project-related changes in water quality, if unmitigated, would have adverse impacts on kidney dialysis patients, and could have adverse impacts on aquarium owners and various other commercial and industrial users. The EIR will further discuss programs to notify the public and mitigate potential negative impacts on these users. Proposed chloramine conversion would also increase the net level of residual disinfectant in drinking water, and there may be noticeable changes in the taste and odor of drinking water. The conversion from chlorine to chloramine will potentially decrease the detectable chlorinous taste and odors in typical customer tap water. Thus, although chloramine conversion would result in minor changes in water quality, the EIR will further discuss how these changes would affect the general public.

11) Energy/Natural Resources. Could the project:	Yes	No	Discussed
(a) Encourage activities which result in the use of large amounts of fuel, water, or energy, or use of these in a wasteful manner?	___	X	X
(b) Have a substantial effect on the potential use, extraction, or depletion of a natural resource?	___	X	X

Because there are no quantitative state or federal standards to indicate what is considered a "large amount" of fuel or energy, significant energy impacts are generally linked with projects that would require substantial energy consumption on an annual basis, or would use fuel or energy in a manner inconsistent with common energy conservation practices. A project may also be deemed to have a

significant effect if substantial changes in utility infrastructure would be needed to accommodate increased electricity and natural-gas demand.

Construction of the proposed project would consume direct energy in the form of fuel and electricity, and indirect energy as a result of the processes employed to make construction materials (e.g., mining and extraction of raw materials, manufacturing, etc.). Construction equipment, including excavators, haul trucks, and vehicles, are expected to consume the majority of the energy resources. Electricity would be used by construction equipment, such as welding machines and power tools.

The energy consumed during project construction would constitute a one-time impact and would not place an ongoing demand on energy resources. Since construction activities would primarily consume energy in the form of fuel, there would be little effect on Pacific Gas and Electric Company (PG&E) and Hetch Hetchy Water and Power energy resources. Energy consumption associated with construction activities, therefore, would result in a less-than-significant impact.

Under operating conditions, project facilities would include regular deliveries of chemicals, pumping equipment, and space heating and air conditioning equipment. The amount of fuel needed for deliveries, the energy needed to operate pumps associated with new chemical feed systems and increased reservoir mixing, and the energy required for space heating and air conditioning in new facilities would not be substantial. The increased number of chemical deliveries would not substantially increase fuel consumption (see checklist item 4, Transportation/Circulation). In addition, most pumps associated with new facilities would be less than 1 horsepower in size. Increased space heating and air conditioning requirements of new facilities would also be limited by the small size of each facility. Substantial upgrades to PG&E's electrical system are not expected to be required. Therefore, energy consumption associated with operational activities would result in a less-than-significant impact.

12) <u>Hazards</u>. Could the project:	<u>Yes</u>	<u>No</u>	<u>Discussed</u>
(a) Create a potential public health hazard or involve the use, production, or disposal of materials which pose a hazard to people or animal or plant populations in the area affected?	*<u>To be determined</u>*		
(b) Interfere with emergency response plans or emergency evacuation plans?	*<u>To be determined</u>*		
(c) Create a potentially substantial fire hazard?	*<u>To be determined</u>*		

Development of proposed facilities at the four main facility locations (Tesla Portal, San Antonio Pump Station, Pulgas Water Temple, and Harry W. Tracy WTP) would increase the number of chemical deliveries and the amount and types of water treatment chemicals stored and used at each of these locations. The EIR will further discuss: (1) the potential to encounter hazardous materials in subsurface materials during project construction; (2) proposed use and storage of treatment chemicals; (3) proposed chemical handling, storage, and transport procedures; (4) potential public health effects associated with transport, storage, and handling of chemicals; (5) potential for accidental releases of treatment chemicals

and associated impacts during normal operations and seismic events; (6) the potential to encounter hazardous building materials; and (7) the potential to interfere with emergency response plans.

Secondary Discharges. The project would not alter existing locations of planned discharges or incidental overflows, but would change the content of discharges from chlorinated water to chloraminated water and would involve operation of dechlorination facilities. The permanent or temporary use of chemicals for dechlorination at these sites will be discussed on a program level in the EIR. Accidental discharges of chlorinated or chloraminated water could also occur in the event of a catastrophic failure of water facilities due to a major earthquake event. The potential for such accidental discharges already exists, and this potential would not be increased by the proposed project. However, any accidental discharges would change from chlorinated water to chloraminated water. Potential impacts of such discharges would be similar to those associated with other secondary discharges and would primarily relate to water quality and aquatic resources (see checklist items 8 and 10, Biology and Water Quality, for more discussion).

13) Cultural. Could the project:	Yes	No	Discussed
(a) Disrupt or adversely affect a prehistoric or historic archaeological site, or a property of historic or cultural significance to a community or ethnic or social group; or a paleontological site, except as a part of a scientific study?	*To be determined*		
(b) Conflict with established recreational, educational, religious, or scientific uses of the area?	*"No" at Tesla and Tracy WTP; to be determined at other facility locations*		
(c) Conflict with the preservation of buildings subject to the Provisions of Article 10 or Article 11 of the Planning Code?		n/a	

Tesla Portal. The proposed chlorine storage and feed facility would be located adjacent to existing water facilities, and one existing structure is proposed for demolition. The EIR will address the existence of or potential for archaeological or historic resources at this site and the potential for cultural resource impacts.

San Antonio Pump Station. The proposed ammonia and chlorine feed facility would be located adjacent to the existing San Antonio Pump Station. The EIR will address the existence of or potential for archaeological or historic resources in areas surrounding this site as well as the Alameda East and West shafts. In addition, the EIR will identify any established recreational uses in the vicinity of this site.

Pulgas Water Temple. The proposed dechloramination facility would be located adjacent to the Pulgas Water Temple. California State Landmark No. 92, the Portola Expedition Camp of November 11, 1769, is located at the Pulgas Water Temple. The Pulgas Water Temple, which is part of the San Francisco Water System, is a California Historic Civil Engineering Landmark and is on the *California Inventory of Historic Resources* under the theme of architecture. It is also listed on the *64 Geologic, Scenic, and Historic Points of Interest in San Mateo County, California* and is on the *Historic Sites Master List for San Mateo County*. Despite these listings, the temple is not listed on the *California Register of*

Historical Resources and has not been evaluated or determined eligible for listing on the *National Register of Historic Places*. The EIR will determine whether the historic Pulgas Water Temple and adjacent areas would be adversely affected by project construction and operation. In addition, the EIR will address the existence of or potential for archaeological or historic resources in the vicinity of this site and will identify any established recreational uses.

Harry W. Tracy WTP. The proposed ammonia feed system would be located adjacent to the existing WTP buildings and a paved parking lot. The EIR will address the existence of or potential for archaeological or historic resources in the vicinity of this site and will identify any established recreational uses.

C. OTHER

Could the project:	Yes	No	Discussed
(a) Require approval and/or permits from city departments other than the Planning Department or Department of Building Inspection, or from regional, state, or federal agencies?	*To be determined*		

The four main facility locations are within the counties of San Mateo, Alameda, and San Joaquin, entirely on property owned by the City and County of San Francisco. The CDD system is located entirely on property owned by and within the City and County of San Francisco. BAWUA agencies' facilities are located within Alameda, San Mateo, and Santa Clara counties. Although proposed facilities are located in these counties, local building and zoning ordinances would not apply to project facilities, pursuant to California Government Code, 53090 et seq.

Depending on the resources encountered at the four main facility locations, construction and operation of the proposed project may require permits/approvals from the following agencies:

- U.S. Fish and Wildlife Service
- California Department of Fish and Game
- U.S. Army Corps of Engineers
- California Regional Water Quality Control Board (Stormwater Pollution Prevention Plan)

D. MITIGATION MEASURES

	Yes	No	Discussed
(1) Could the project have significant effects if mitigation measures are not included in the project?	X		X
(2) Are all mitigation measures necessary to eliminate significant effects included in the project?	X		X

The following mitigation measures relate to environmental effects determined to require no further analysis in the EIR. The EIR will contain a mitigation chapter describing the measures, which are proposed as part of the project, and will include other measures which would be, or could be, adopted to reduce potential adverse effects of the project.

Mitigation Measure 1 – Construction Air Quality

The following measures for mitigating emissions of air pollutants during project construction, required by the Bay Area Air Quality Management District, will be incorporated into the proposed project as construction specifications. These basic and enhanced control measures for construction emissions of fine particulate matter would be implemented as necessary depending on weather conditions:

1. Water all active construction sites at least twice daily, and more often on days when winds exceed 10 to 15 miles per hour.
2. Cover all trucks hauling soil, sand, and other loose materials *or* maintain at least 2 feet of freeboard in trucks hauling such materials.
3. Pave, apply water three times daily, or apply nontoxic soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.
4. Using water sweepers, sweep all paved access roads, parking areas, and staging areas at construction sites on a daily basis.
5. Using water sweepers, sweep streets adjacent to construction sites daily if visible soil material is carried onto adjacent public streets.

For construction areas involving disturbance of more than four acres, the following enhanced control measures will be implemented:

6. Hydroseed or apply nontoxic soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more).
7. Enclose, cover, water twice daily, or apply nontoxic soil binders to exposed stockpiles (dirt, sand, etc.).
8. Limit traffic speeds on unpaved roads to 15 miles per hour.
9. Install sandbags or other erosion-control measures to prevent silt runoff to public roadways.
10. Replant vegetation in disturbed areas as quickly as possible.

Mitigation Measure 2 – Construction Utilities/Public Services

The following measures will be incorporated into the proposed project to reduce the potential for service disruptions during project construction:

1. The SFPUC will coordinate its planning and design efforts with other utilities, including identification of utility line locations, early consultation with affected utilities, and avoidance of affected utility lines. If avoidance is not possible and relocation of any existing utilities is required, the SFPUC and affected agency will mutually arrange for the movement of the facility prior to construction of the proposed project.

2. To minimize delays in emergency response during project construction, all potentially affected police, fire protection and ambulance services shall be notified in advance of the times, duration and location of construction activities throughout the project's construction process. This measure shall be included in construction specifications.

E. ALTERNATIVES CONSIDERED

As previously discussed under the project background and overview sections, the SFPUC has conducted extensive studies on the SFPUC water supply system related to improving reliability and to meeting recent and anticipated water quality regulations. These studies identified and evaluated a comprehensive range of alternative treatment methods and facilities needed for improvements related to disinfection, corrosion control, ozonation, and filtration processes.[16] Chloramine conversion is only one aspect of the overall Hetch Hetchy Water Treatment Project, and conversion to chloramine was determined to be the only treatment method that could reliably meet the requirements of the Stage 1 Disinfectant/Disinfection By-Products Rule. Thus, other treatment alternatives evaluated in the preliminary engineering report, including the No Project Alternative, would not achieve the objectives of the SFPUC Chloramine Conversion project.

The conceptual engineering study for the SFPUC Chloramine Conversion project examined alternative facility sites and combinations of facility sites that would achieve the water quality objectives of the proposed project. There were 11 potential sites identified for chloramination or dechloramination facilities as follows: Moccasin Reservoir, Rock River, Oakdale Portal, Oakdale Shaft, Albers Road Valve House, San Joaquin Valve House, Red Mountain Bar, Tesla Portal, San Antonio Pump Station, Alameda West Shaft, and Pulgas Water Temple area. Various combinations of facilities at these sites were evaluated for the ability to meet project objectives. However, due to the layout of the SFPUC water supply system, construction of facilities at any of the alternative locations would require new facilities at Tesla Portal, Sunol Valley area, and Pulgas Water Temple area as well. For the Pulgas area in particular, there are no alternative locations for a dechloramination facility, since this process must occur in the immediate vicinity of the discharge to Crystal Springs Reservoir. Therefore, all engineering alternative sites east of Tesla Portal were eliminated from further consideration in the EIR, since those alternative combinations would result in disturbance of additional sites and in greater environmental impacts compared to the preferred alternative.

For the EIR, alternatives to the proposed project will be developed based on the same basic conceptual engineering plans for the preferred alternative. These alternatives would consist of minor variants of the preferred alternative, such as changes in footprint or site layout, that may be required to mitigate any negative impacts should they become known during the EIR analysis. The No Project Alternative will also be analyzed in the EIR.

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16 San Francisco Water Team, *Hetch Hetchy Water Treatment Project Phase 1A Preliminary Engineering Report*, prepared for the San Francisco Public Utilities Commission, August 1996.

F. MANDATORY FINDINGS OF SIGNIFICANCE

	Yes	No	Discussed
1) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	X		
Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals?		X	
Does the project have possible environmental effects which are individually limited, but cumulatively considerable? (Analyze in the light of past projects, other current projects, and probable future projects.)	*To be determined*		
2) Would the project cause substantial adverse effects on human beings, either directly or indirectly?	*To be determined*		

G. ON THE BASIS OF THIS INITIAL STUDY

___ I find the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared by the Planning Department.

___ I find that although the proposed project could have a significant effect on the environment, there WILL NOT be a significant effect in this case because the mitigation measures, numbers _____ , in this discussion have been included as part of the proposed project. A NEGATIVE DECLARATION will be prepared by the Planning Department.

_X_ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

Date

HILLARY E. GITELMAN
Environmental Review Officer
for
GERALD G. GREEN
Director of Planning
Planning Department

APPENDIX B

EIR AUTHORS AND CONSULTANTS; ORGANIZATIONS AND PERSONS CONSULTED

EIR AUTHORS

CITY AND COUNTY OF SAN FRANCISCO PLANNING DEPARTMENT

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APPENDIX C

SPECIAL-STATUS SPECIES TABLES

A list of special-status plant and animal species potentially occurring within the vicinity of the proposed project sites was compiled on the basis of contacts with the resource agencies, records from the California Natural Diversity Database (CNDDB) (CNDDB, 1999), local and general biological literature (Tetra Tech, Inc., 1998; USFWS, 1998, 1997a, 1997b, 1996, 1985; Sawyer and Keeler-Wolf, 1995; Larsen, 1994; Hickman, 1993; McGinnis, 1993, 1992; Jameson, 1988; Mayer and Laudenslayer, 1988; Holland, 1986; Stebbins, 1985), previous and ongoing biological reports of the site and vicinity (ESA, 1999), technical reports from commercial and government databases (Wildlife Worldwide, the California Native Plant Society's *Inventory of Rare and Endangered Vascular Plants of California* (Skinner and Pavlik, 1994), and the California Department of Fish and Game Wildlife Habitat Relationships System (CDFG, 1999). The list is intended to be comprehensive, and the "Potential for Occurrence" designations apply to habitats in close proximity to facilities that would not necessarily be impacted by the project, since some of the proposed activities are minor upgrades to existing sites. Table C-1 presents the list of special-status species with potential to occur at the Sunol Valley and Telsa Portal project sites. Table C-2 presents the list of special-status species with potential to occur at the Peninsula area project sites.

TABLE C-1
SPECIAL-STATUS SPECIES REPORTED OR POTENTIALLY OCCURRING AT THE SAN ANTONIO PUMP STATION, ALAMEDA EAST AND WEST PORTALS, AND TESLA SITES

Common name *Scientific name*	**Listing Status USFWS/ CDFG/CNPS**	**Habitat Requirements**	**Potential to Occur**[a]	**Period of Identification / Flowering Period**
SPECIES LISTED OR PROPOSED FOR LISTING				
Invertebrates				
Bay checkerspot butterfly *Euphydryas editha bayensis*	FT/--/--	Serpentine grasslands.	Low, no nearby sightings; no larval food plants identified.	March-May
Callippe silverspot butterfly *Speyeria callippe callippe*	FE/--/--	Found in native grasslands with *Viola pedunculata* as larval food plant.	Low, no nearby sightings; no larval food plants identified.	Spring
Myrtle silverspot butterfly *Speyeria zerene myrtleae*	FE/--/--	Found in native grasslands with *Viola pedunculata* as larval food plant.	Low, no nearby sightings; no larval food plants identified.	Spring
Fish				
Steelhead trout *Oncorhynchus mykiss*	FT/--/--	Freshwater streams.	Low, migration barriers in the City of Fremont prevent passage of this species into the project region.	Year-round
Amphibians				
California red-legged frog *Rana aurora draytonii*	FT/CSC/--	Breed in stock ponds, pools, and slow-moving streams with emergent vegetation for escape cover and egg attachment.	Low, this species may occur in Alameda Creek, but no suitable upland or aquatic habitat occurs on the project sites.	April-June
California tiger salamander *Ambystoma californiense*	FC/CSC/--	Seasonal freshwater ponds with little or no emergent vegetation.	Moderate, pasturelands between Alameda Creek and the Alameda West Portal site may provide upland aestivation habitat; no breeding habitat noted near the site.	November-May
Reptiles				
Alameda whipsnake *Masticophis lateralis euryxanthus*	FT/CT/--	Coast ranges in chaparral, scrub, woodland, and riparian habitats with woody debris and rocky outcrops; generally south-facing slopes.	Low	Year-round

TABLE C-1 (Continued)
SPECIAL-STATUS SPECIES REPORTED OR POTENTIALLY OCCURRING AT THE SAN ANTONIO PUMP STATION, ALAMEDA EAST AND WEST SITES, AND TESLA SITE

Common name *Scientific name*	Listing Status USFWS/ CDFG/CNPS	Habitat Requirements	Potential to Occur[a]	Period of Identification / Flowering Period
SPECIES LISTED OR PROPOSED FOR LISTING				
Birds				
Aleutian Canada goose *Branta canadensis leucopareia*	FT/--/--	Winters in marshes, meadows, and on small islands.	Low	Winter
American peregrine falcon *Falco peregrinus anatum*	--/CE/--	Nests in cliffs and outcrops.	Low	Year-round
Bald eagle[b] *Haliaeetus leucocephalus*	FT/CE/--	Nests and forages on inland lakes, reservoirs, and rivers.	Low	Winter
Mammals				
San Joaquin kit fox *Vulpes macrotis mutica*	FE/CT/--	Annual grasslands or grassy open stages with scattered shrubby vegetation; need loose-textured sandy soils for burrowing.	Moderate, a suitable burrow and supporting grasslands habitat was noted at the Tesla Portal site; this site is within the San Joaquin kit fox range.	Year-round
Plants				
Presidio clarkia *Clarkia franciscana*	FE/CE/1B	Coastal scrub, grassland (ultramafic).	Low	May-July
Santa Clara Valley dudleya *Dudleya setchellii*	FE/--/1B	Ultramafic grasslands.	Low	May-June
Contra Costa goldfields *Lasthenia conjugens*	FE/--/1B	Moist grasslands, vernal pools.	Low	March-June
Metcalf Canyon jewelflower *Streptanthus albidus* ssp. *Albidus*	FE/--/1B	Serpentine grassland, barrens.	Low	April-June
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN				
Invertebrates				
Opler's longhorn moth *Adella oplerella*	FSC/--/--	Serpentine grasslands.	Low	Spring
Serpentine phalangid *Calcina serpentinea*	FSC/--/--	Serpentinite rocks and barrens.	Low	Fall-Winter
Monarch butterfly *Danaus plexippus*	--/*/--	Eucalyptus groves (winter sites).	Low	Winter
Ricksecker's water scavenger beetle *Hydrochara rickseckeri*	FSC/--/--	Found in freshwater ponds, shallow water of streams, marshes, and lakes.	Low	January-July
Curved-foot hygrotus diving beetle *Hygrotus curvipes*	FSC/--/--	Found in vernal pools and alkali flats.	Low	January-July

TABLE C-1 (Continued)
SPECIAL-STATUS SPECIES REPORTED OR POTENTIALLY OCCURRING AT THE SAN ANTONIO PUMP STATION, ALAMEDA EAST AND WEST SITES, AND TESLA SITE

Common name *Scientific name*	**Listing Status USFWS/ CDFG/CNPS**	**Habitat Requirements**	**Potential to Occur**[a]	**Period of Identification / Flowering Period**
Unsilvered fritillary butterfly *Speyeria adiaste adiaste*	FSC/--/--	Found in native grasslands with *Viola pedunculata* as larval food plant.	Low	Spring
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN (cont.)				
Amphibians				
Foothill yellow-legged frog *Rana boylii*	FSC/CSC/--	Streams with quiet pools absent of predatory fish.	Low, suitable habitat not present on the project sites; may occur in Alameda Creek and adjacent habitats.	April-June
Western spadefoot toad *Scaphiopus hammondii*	FSC/CSC/--	Floodplains and grassland pools.	Low	February-August
Reptiles				
Western pond turtle *Clemmys marmorata*	FSC/CSC/--	Freshwater ponds and slow streams edged with sandy soils for laying eggs.	Low, suitable habitat not present on the project sites; may occur in Alameda Creek and adjacent habitats.	Year-round
Coastal western whiptail *Cnemidophorus tigris multiscutatus*	FSC/--/--	Dry open habitats.	Low	Year-round
San Joaquin coachwhip *Masticophis flagellum ruddocki*	FSC/CSC/--	Prairie, scrublands, woodlands, farmlands, or grasslands with varying amounts of cover.	Low	Year-round
California horned lizard *Phrynosoma coronatum frontale*	FSC/CSC/--	Patchy open areas with sandy soils.	Low	Year-round
Birds				
Cooper's hawk *Accipiter cooperi*	--/CSC/--	Nests in riparian growths of deciduous trees and live oaks.	Low, though seen overhead in the Sunol Valley, nesting habitat does not occur at the project sites.	March-July
Sharp-shinned hawk *Accipiter striatus*	--/CSC/--	Nests in riparian growths of deciduous trees and live oaks.	Low, breeding habitat does not occur at the project sites; all sites are outside the reported winter breeding range.	March-July
Tricolored blackbird *Agelaius tricolor*	FSC/CSC/--	Riparian thickets and emergent vegetation.	Low	Spring

TABLE C-1 (Continued)
SPECIAL-STATUS SPECIES REPORTED OR POTENTIALLY OCCURRING AT THE SAN ANTONIO PUMP STATION, ALAMEDA EAST AND WEST SITES, AND TESLA SITE

Common name *Scientific name*	Listing Status USFWS/ CDFG/CNPS	Habitat Requirements	Potential to Occur[a]	Period of Identification / Flowering Period
Golden eagle *Aquila chrysaetos*	BPA/CSC/--	Nests in large trees, snags, and cliffs, winters on lakes and reservoir.	Low, though seen overhead in the Sunol Valley, nesting habitat does not occur at the project sites.	Spring
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN (cont.)				
<u>Birds (cont.)</u>				
Great blue heron *Ardea herodias*	--/*/--	Nests in trees along lakes and estuaries.	Low	December-July
Short-eared owl *Asio flammeus (nesting)*	--/CSC/--	Requires dense vegetation; tall grasslands, brush, ditches, and wetlands. Nests on dry ground concealed with vegetation. Treeless areas with fences or mounds for perching.	Low – Moderate, nesting habitat may occur at the San Antonio Pump Station and Tesla Portal sites, though habitat is considered marginal.	September-April
Northern harrier *Circus cyaneus*	--/CSC/--	Nests and forages in wet meadows and pastures.	Low, nesting habitat does not occur at the project sites. Grasslands at the San Antonio Pump Station site are not expected to support this species.	Year-round
White-tailed kite *Elanus leucurus*	--/3511/--	Nests near wet meadows and open grasslands with trees.	Low	March-July
California horned lark *Eremophila alpestris actia*	--/CSC/--	Open grasslands and irrigated pastures; builds grass-lined nests on the ground.	Low, no reported occurrences near any of the sites; grasslands at the San Antonio Pump Station site are considered marginal.	Year-round
Prairie falcon *Falco mexicanus*	--/CSC/--	Nests in open terrain with canyons, cliffs, escarpments, and rock outcrops.	Low	Spring
Loggerhead shrike *Lanius ludovicianus*	FSC/CSC/--	Nests in shrublands and forages in open grasslands.	Moderate, two adult shrikes were observed near the San Antonio Pump Station site; nesting may occur in large shrubs at this site. No breeding potential at other sites.	March-September

TABLE C-1 (Continued)
SPECIAL-STATUS SPECIES REPORTED OR POTENTIALLY OCCURRING AT THE SAN ANTONIO PUMP STATION, ALAMEDA EAST AND WEST SITES, AND TESLA SITE

Common name *Scientific name*	Listing Status USFWS/ CDFG/CNPS	Habitat Requirements	Potential to Occur[a]	Period of Identification / Flowering Period
Burrowing owl *Speotyto (=Athene) cunicularia (burrow sites)*	FSC/CSC/--	Nests in mammal burrows in open, sloping grasslands.	Moderate, a suitable burrow and supporting grasslands habitat was noted at the Tesla Portal site; this site is within the burrowing owl's range.	February-June
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN (cont.)				
Mammals				
Pallid bat *Antrozous pallidus*	FSC/CSC/--	Day roosts are mainly in caves, crevices, and mines; also found in buildings and under bark. Forages in open lowland areas.	Low	February-August
Greater western mastiff bat *Eumops perotis californicus*	FSC/CSC/--	Needs rock crevices, grassland, coastal scrub; may use urban areas.	Low	February-August
Small-footed myotis *Myotis ciliolabrum*	FSC/--/--	Roosts in caves, buildings, mines, and crevices, sometimes bridges and bark.	Low	February-August
Fringed myotis *Myotis evotis*	FSC/--/--	Roosts in caves, old buildings, and under bark.	Low	February-August
Long-legged myotis *Myotis volans*	FSC/--/--	Roosts in rock crevices, buildings, tree bark, snags, mines, and caves. Trees are perhaps the most important daytime roosts for this species.	Low	February-August
San Joaquin pocket mouse *Perognathus inornatus inornatus*	FSC/--/--	Flat ground and low hills in the Central Valley.	Low, habitat for this species does not occur at the Tesla Portal site; area is mostly barren with few small mammal burrows.	Year-round
Townsend's big-eared bat *Plecotus townsendii*	FSC/CSC/--	Roosts in caves, old buildings, and under bark; forages in open lowland areas and forms large maternity colonies in spring.	Low	February-August
American badger *Taxidea taxus*	--/*/--	Open grasslands with loose, friable soils.	Low, no evidence of species presence was noted at any of the project sites.	Year-round
Plants				
Santa Clara thorn mint *Acanthomintha lanceolata*	--/--/4	Chaparral, shale scree.	Low	March-June
Balsamroot *Balsamorhiza macrolepis var. macrolepis*	--/--/1B	Cismontane woodland, grassland.	Low	March-June

TABLE C-1 (Continued)
SPECIAL-STATUS SPECIES REPORTED OR POTENTIALLY OCCURRING AT THE SAN ANTONIO PUMP STATION, ALAMEDA EAST AND WEST SITES, AND TESLA SITE

Common name *Scientific name*	Listing Status USFWS/ CDFG/CNPS	Habitat Requirements	Potential to Occur[a]	Period of Identification / Flowering Period
Oakland star-tulip *Calochortus umbellatus*	--/--/4	Broad-leaved upland forests, chaparral, lower montane coniferous forests, grasslands, often on serpentine soils.	Low	March-May
Sharsmith's harebell *Campanula sharsmithiae*	FSC/--/1B	Chaparral, ultramafic talus.	Low	May-June
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN (cont.)				
Plants (cont.)				
Mt. Hamilton thistle *Cirsium fontinale* var. *campylon*	FSC/--/1B	Ultramafic seeps, sandy streams.	Low	February-October
Brewer's clarkia *Clarkia breweri*	--/--/4	Chaparral, shale talus.	Low	April-May
Santa Clara red ribbons *Clarkia concinna* ssp. *automixa*	FSC/--/1B	Coastal scrub, grassland (ultramafic).	Low	May-July
Serpentine collomia *Collomia diversifolia*	--/--/4	Serpentine seeps, streams.	Low	May-June
Mt. Hamilton coreopsis *Coreopsis hamiltonii*	FSC/--/1B	Steep, shale talus, woodland.	Low	March-May
Inner Coast Range Larkspur *Delphinium californicum* ssp. *interius*	FSC/--/1B	Dry ravines.	Low	April-June
Western leatherwood *Dirca occidentalis*	--/--/1B	Broad-leaved upland forests, closed-cone coniferous forests, chaparral, cismontane woodland, North Coast coniferous forests, riparian forests, riparian woodland, mesic sites.	Low	January-March
Tiburon buckwheat *Eriogonum luteolum* var. *caninum*	--/--/3	Chaparral, coastal prairie, grasslands, usually on serpentinite rock outcrops.	Low	June-September
Ben Lomond buckwheat *Eriogonum nudum* var. *decurrens*	--/--/1B	Chaparral, coastal prairie, grasslands, usually on serpentine soils.	Low	June-September
Jepson's woolly sunflower *Eriophyllum jepsonii*	--/--/4	Coastal scrub.	Low	April-June
Hoover's button-celery *Eryngium aristulatum* var. *hooveri*	FSC /--/1B	Vernal pools.	Low	May-August
Stinkbells *Fritillaria agrestis*	--/--/4	Valley and foothill grasslands, oak woodlands; on clay flats; sometimes on serpentine soils.	Low	March-April
Talus fritillary *Fritillaria falcata*	FSC/--/1B	Chaparral, woodland, on talus.	Low	March-May

TABLE C-1 (Continued)
SPECIAL-STATUS SPECIES REPORTED OR POTENTIALLY OCCURRING AT THE SAN ANTONIO PUMP STATION, ALAMEDA EAST AND WEST SITES, AND TESLA SITE

Common name *Scientific name*	Listing Status USFWS/ CDFG/CNPS	Habitat Requirements	Potential to Occur[a]	Period of Identification / Flowering Period
Fragrant fritillary *Fritillaria liliacea*	FSC/--/1B	Coastal scrub, valley and foothill grassland, coastal prairie; on heavy clay soils, often on ultramafic soils.	Low	February-April
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN (cont.)				
Plants (cont.)				
Woolly-headed lessingia *Lessingia hololeuca*	--/--/3	Grasslands.	Low	June-October
Arcuate bush mallow *Malacothamnus arcuatus*	--/--/4	Chaparral.	Low	April-July
Hall's bush mallow *Malacothamnus hallii*	--/--/4	Chaparral.	Low	May-September
Gairdner's yampah *Perideridia gairdneri*	FSC/--/1B	Broad-leaved upland forest, chaparral.	Low	June-July
Mt. Diablo phacelia *Phacelia phacelioides*	FSC/--/1B	Cismontane woodland, chaparral.	Low	April-May
Forget-me-not popcorn flower *Plagiobothrys myosotoides*	--/--/4	Chaparral.	Low	April-May
Lobb's aquatic buttercup *Ranunculus lobbii*	--/--/4	Ponds, pools, watering holes.	Low	February-April
Rock sanicle *Sanicula saxitilis*	FSC/CR/1B	Broad-leaved upland forest, chaparral, valley and foothill grassland.	Low	April-May
Maple-leaved checkerbloom *Sidalcea malachroides*	--/--/1B	Grasslands.	Low	April-June
Most beautiful jewelflower *Streptanthus albidus* ssp. *peramoenus*	FSC/--/1B	Serpentine grassland, chaparral.	Low	April-June
Mt. Hamilton jewelflower *Streptanthus callistus*	FSC/--/1B	Shale talus.	Low	April-May
Mt. Diablo jewelflower *Streptanthus hispidus*	FSC/--/1B	Grassland.	Low	March-June
Mt. Diablo cottonweed *Stylocline amphibola*	--/--/4	Broad-leaved upland forest, chaparral.	Low	April-May
Showy Indian clover *Trifolium amoenum*	FSC/--/1A	Grasslands.	Low	April-June
Caper-fruited tropidocarpum *Tropidocarpum capparideum*	FSC/--/1A	Alkaline hills, grasslands.	Low	March-April

TABLE C-1 (Continued)
SPECIAL STATUS SPECIES REPORTED OR POTENTIALLY OCCURRING AT THE SAN ANTONIO PUMP STATION, ALAMEDA EAST AND WEST SITES, AND TESLA SITE

STATUS CODES:

Federal Categories (U.S. Fish and Wildlife Service)

FE = Listed as Endangered by the Federal Government
FE = Listed as Endangered by the Federal Government
FT = Listed as Threatened by the Federal Government
FPE = Proposed for Listing as Endangered
FPT = Proposed for Listing as Threatened
FC = Candidate for Federal Listing
FSC = Federal Species of Concern
BPA = Federal Bald Eagle Protection Act

California Native Plant Society (CNPS)

List 1A = Plants presumed extinct in California
List 1B = Plants rare, threatened, or endangered in California and elsewhere
List 2 = Plants rare, threatened, or endangered in California but more common
List 3 = Plants about which more information is needed
List 4 = Plants of limited distribution

State Categories (California Department of Fish and Game)

CE = Listed as Endangered by the State of California
CT = Listed as Threatened by the State of California
CR = Listed as Rare by the State of California
CSC = California Species of Special Concern

3511 = A Fully Protected Species
* = Special Animals
3503.5 =Protection for nesting species of Falconiformes (hawks) and Strigiformes (owls)

[a] High Potential = Species expected to occur and meets all habitats as defined in list.
Moderate Potential = Habitat only marginally suitable or suitable but not within species geographic range.
Low Potential = Habitat does not meet species requirements as currently understood in the scientific community.

[b] The bald eagle was proposed for delisting by the U.S. Fish and Wildlife Service on July 6, 1999.

-- = No listing status; NK = Not known, information unavailable.

SOURCES: CNDDB, 1999; CDFG, 1999

TABLE C-2
SPECIAL-STATUS SPECIES REPORTED OR POTENTIALLY OCCURRING NEAR THE PENINSULA AREA PROJECT SITES

Common name *Scientific name*	Listing Status USFWS/ CDFG/CNPS	Habitat Requirements	Potential to Occur[a]	Period of Identification / Flowering Period
		SPECIES LISTED OR PROPOSED FOR LISTING		
Invertebrates				
Bay checkerspot butterfly *Euphydryas editha bayensis*	FT/--/--	Serpentine bunchgrass grassland.	Low, no nearby sightings; no larval food plants identified.	March-May
Mission blue butterfly *Icaricia icarioides missionensis*	FE/--/--	Grassland with *Lupinus albifrons*, *L. formosa*, and *L. varicolor.*	Low, no nearby sightings; no larval food plants identified.	March-June
San Bruno elfin butterfly *Incisalia mossii bayensis*	FE/--/--	Found in coastal scrub.	Low, no nearby sightings; no larval food plants identified.	March-April
Callippe silverspot butterfly *Speyeria callippe callippe*	FE/--/--	Found in native grasslands with *Viola pedunculata* as larval food plant.	Low, no nearby sightings; no larval food plants identified.	Spring
Myrtle silverspot butterfly *Speyeria zerene myrtleae*	FE/--/--	Found in native grasslands with *Viola pedunculata* as larval food plant.	Low, no nearby sightings; no larval food plants identified.	Spring
Fish				
Steelhead trout *Oncorhynchus mykiss*	FT/--/--	Unblocked Bay Area and coastal rivers and streams.	Low, no streams in the project area support this species.	Year-round
Amphibians				
California red-legged frog *Rana aurora draytonii*	FT/CSC/--	Breed in stock ponds, pools, and slow-moving streams with emergent vegetation for escape cover and egg attachment.	High, potential breeding and aestivation habitat occur in an unnamed creek 50 ft. north of Pulgas Water Temple site. Also, known to occur northwest of the site.	Year-round
Reptiles				
San Francisco garter snake *Thamnophis sirtalis tetrataenia*	FE/CE/--	Freshwater ponds and slow streams with emergent vegetation; nearby upland grasslands with small rodent burrows may also provide habitat for this species. Little is known about the seasonal movements of this species or its capacity for using upland areas.	High, potential breeding and aestivation habitat occur in an unnamed creek 50 ft. north of Pulgas Water Temple site. Also, known to occur northwest of the site.	Year-round

TABLE C-2 (Continued)
SPECIAL-STATUS SPECIES REPORTED OR POTENTIALLY OCCURRING NEAR THE PENINSULA AREA PROJECT SITES

Common name *Scientific name*	Listing Status USFWS/ CDFG/CNPS	Habitat Requirements	Potential to Occur[a]	Period of Identification / Flowering Period
SPECIES LISTED OR PROPOSED FOR LISTING (cont.)				
Birds				
Marbled murrelet *Brachyramphus marmoratus*	FT/CE/--	Nests in dense, old-growth forests along coast.	Low	Year-round
American peregrine falcon *Falco peregrinus anatum*	--/CE/--	Nests in cliffs and outcrops.	Low	Year-round
Bald eagle[b] *Haliaeetus leucocephalus*	FT/CE/--	Nests and forages on inland lakes, reservoirs, and rivers.	Low	Winter
Northern spotted owl *Strix occidentalis caurina*	FT/--/--	Nests in old-growth forests.	Low	Year-round
Plants				
San Mateo thorn-mint *Acanthomintha duttonii*	FE/CE/1B	Grassland and chaparral with serpentine soil.	Low, serpentine soils do not occur in the project area.	April-June
San Bruno Mtn. Manzanita *Arctostaphylos imbricata*	FSC/CE/1B	Chaparral, coastal scrub.	Low	February-May
Robust spineflower *Chorizanthe robusta*	FE/--/1B	Coastal scrub, coastal sand dunes, openings in oak woodlands with sandy or gravelly soil.	Low	April-September
Fountain thistle *Cirsium fontinale var. fontinale*	FE/CE/1B	Grassland and openings in chaparral, in serpentine soil seeps.	Low, serpentine soils do not occur at the project sites.	June-October
Marin dwarf flax *Hesperolinon congestum*	FT/CT/1B	Grassland and openings in chaparral, often on serpentine soils.	Low, serpentine soils do not occur at the project sites.	May-July
Hickman's cinquefoil *Potentilla hickmanii*	FE/CE/1B	Coastal bluff scrub, vernally mesic meadows, open pine forests.	Low	April-August
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN				
Invertebrates				
Ricksecker's water scavenger beetle *Hydrochara rickseckeri*	FSC/--/--	Found in freshwater ponds, shallow water of streams, marshes, and lakes.	Low	January-July
Leech's skyline diving beetle *Hydroporus leechi*	FSC/--/--	Found in freshwater ponds, shallow water of streams, marshes, and lakes.	Low	January-July
Curved-foot hygrotus diving beetle *Hygrotus curvipes*	FSC/--/--	Found in vernal pools and alkali flats.	Low	January-July
Opler's longhorn moth *Adella oplerella*	FSC/--/--	Serpentine bunchgrass grassland.	Low	Spring

TABLE C-2 (Continued)
SPECIAL-STATUS SPECIES REPORTED OR POTENTIALLY OCCURRING NEAR THE PENINSULA AREA PROJECT SITES

Common name *Scientific name*	Listing Status USFWS/ CDFG/CNPS	Habitat Requirements	Potential to Occur[a]	Period of Identification / Flowering Period
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN (cont.)				
Invertebrates				
Edgewood blind harvestman *Calcinia minor*	FSC/--/--	Serpentine rock outcrops and barrens.	Low	Fall-Winter
Serpentine phalangid *Calcina serpentinea*	FSC/--/--	Serpentine rocks and barrens.	Low	Fall-Winter
Monarch butterfly *Danaus plexippus*	--/*/--	Eucalyptus groves (winter sites).	Low	Winter
San Francisco fork-tailed damselfly *Ischnura gemina*	FSC/--/--	Wetlands with emergent vegetation.	Low	April-October
San Francisco lacewing *Nothochrysa californica*	FSC/--/--	Grasslands.	Unknown, the nonnative annual grasslands at Pulgas Water Temple site may provide low-quality habitat for this species.	Spring
Unsilvered fritillary butterfly *Speyeria adiaste adiaste*	FSC/--/--	Found in native grasslands with *Viola pedunculata* as larval food plant.	Low, no nearby sightings; no larval food plants required by this species.	Spring
Amphibians				
Foothill yellow-legged frog *Rana boylii*	FSC/CSC/--	Streams with quiet pools absent of predatory fish.	Low	April-June
Western spadefoot toad *Scaphiopus hammondii*	FSC/CSC/--	Floodplains and grassland pools.	Low	February-August
Reptiles				
Western pond turtle *Clemmys marmorata*	FSC/CSC/--	Freshwater ponds and slow streams edged with sandy soils for laying eggs.	Low	Year-round
California horned lizard *Phrynosoma coronatum frontale*	FSC/CSC/--	Patchy open areas with sandy soils.	Low	Year-round
Birds				
Cooper's hawk *Accipiter cooperi*	--/CSC/--	Nests in riparian growths of deciduous trees and live oak woodlands.	Moderate, nesting habitat occurs in dense live oak stands northwest of Pulgas Water Temple site.	March-July

TABLE C-2 (Continued)
SPECIAL-STATUS SPECIES REPORTED OR POTENTIALLY OCCURRING NEAR THE PENINSULA AREA PROJECT SITES

Common name *Scientific name*	**Listing Status USFWS/ CDFG/CNPS**	**Habitat Requirements**	**Potential to Occur**[a]	**Period of Identification / Flowering Period**
		FEDERAL OR STATE SPECIES OF SPECIAL CONCERN (cont.)		
Birds (cont.)				
Sharp-shinned hawk *Accipiter striatus*	--/CSC/--	Nests in riparian growths of deciduous trees and live oaks.	Moderate, usually nests in dense conifer stands; foraging habitat is available northwest of Pulgas Water Temple site.	March-July
Great blue heron *Ardea herodias*	--/*/--	Nests in trees along lakes and estuaries.	Low, nesting habitat may occur in large trees northwest of Pulgas Water Temple site; nesting colonies have not been previously reported.	December-July
Northern harrier *Circus cyaneus*	--/CSC/--	Mostly nests in emergent vegetation, wet meadows, or near rivers and lakes, but may nest in grasslands away from water.	Moderate, nesting habitat is available at Pulgas Water Temple site.	Year-round
White-tailed kite *Elanus leucurus*	--/3511/--	Nests near wet meadows and open grasslands, dense oak, willow, or other large tree stands.	Moderate, the dense oak and willow stands at Pulgas Water Temple site may provide habitat, but occur off the project site.	March-July
California horned lark *Eremophila alpestris actia*	--/CSC/--	Open grasslands and irrigated pastures.	Low	Year-round
Saltmarsh common yellowthroat *Geothlypic trichas sinuosa*	FSC/CSC/--	Saline and freshwater marshes.	High, willow stands northwest of Pulgas Water Temple site provide high-quality nesting habitat; breeding is reported at Crystal Springs Reservoir.	Year-round
Loggerhead shrike *Lanius ludovicianus*	FSC/CSC/--	Nests in shrublands and forages in open grasslands.	Low, Pulgas Water Temple site may provide foraging habitat; breeding habitat may occur in adjacent wooded areas.	March-September
Osprey *Pandion haliaetus*	--/CSC/--	Nests near freshwater lakes and large streams on large snags.	Low	March-June

TABLE C-2 (Continued)
SPECIAL-STATUS SPECIES REPORTED OR POTENTIALLY OCCURRING NEAR THE PENINSULA AREA PROJECT SITES

Common name *Scientific name*	Listing Status USFWS/ CDFG/CNPS	Habitat Requirements	Potential to Occur[a]	Period of Identification / Flowering Period
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN (cont.)				
Birds (cont.)				
American white pelican *Pelecanus erythrorhynchos*	--/CSC/--	Nests on protected islets near freshwater lakes for protection from predators.	Low	May-July
California spotted owl *Strix occidentalis occidentalis*	FSC/CSC/--	Nests in old-growth forests.	Low	March-September
Mammals				
Pallid bat *Antrozous pallidus*	--/CSC/--	Day roosts are mainly in caves, crevices, and mines; also found in buildings and under bark. Forages in open lowland areas.	Moderate, roosting habitat is available in large-diameter trees near the Pulgas Water Temple and northwest of the Pulgas Water Temple site.	February-August
Greater western mastiff bat *Eumops perotis californicus*	FSC/CSC/--	Needs rock crevices, grassland, coastal scrub; may use urban areas.	Moderate, roosting habitat is available in large-diameter trees near the Pulgas Water Temple and northwest of the Pulgas Water Temple site.	February-August
Small-footed myotis *Myotis ciliolabrum*	FSC/--/--	Roosts in caves, buildings, mines, and crevices, sometimes bridges and bark.	Moderate, roosting habitat is available in large-diameter trees near the Pulgas Water Temple and northwest of the Pulgas Water Temple site.	February-August
Long-eared myotis *Myotis evotis*	FSC/--/--	Roosts in buildings, crevices, under bark, snags, and in forests. Caves are the primary night roost.	Moderate, roosting habitat is available in large-diameter trees near the Pulgas Water Temple and northwest of the Pulgas Water Temple site.	February-August

TABLE C-2 (Continued)
SPECIAL-STATUS SPECIES REPORTED OR POTENTIALLY OCCURRING NEAR THE PENINSULA AREA PROJECT SITES

Common name *Scientific name*	Listing Status USFWS/ CDFG/CNPS	Habitat Requirements	Potential to Occur[a]	Period of Identification / Flowering Period
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN (cont.)				
Mammals (cont.)				
Fringed myotis *Myotis thysanodes*	FSC/--/--	Roosts in caves, old buildings, and under bark.	Moderate, roosting habitat is available in large-diameter trees near the Pulgas Water Temple and northwest of the Pulgas Water Temple site.	February-August
Long-legged myotis *Myotis volans*	FSC/--/--	Roosts in rock crevices, buildings, tree bark, snags, mines, and caves. Trees are perhaps the most important daytime roosts for this species.	Moderate, roosting habitat is available in large-diameter trees near the Pulgas Water Temple and northwest of the Pulgas Water Temple site.	February-August
Townsend's big-eared bat *Plecotus townsendii*	FSC/CSC/--	Roosts in caves, mines, buildings or other human-made structures. Forages in open lowland areas.	Low	February-August
Plants				
Coast rock cress *Arabis blepharophylla*	--/--/4	Broad-leaved upland forests, coastal prairie, coastal scrub; often in rocky places.	Low	February-April
Montara manzanita *Arctostaphylos montaraensis*	FC/--/1B	Maritime chaparral, coastal scrub.	Low	January-March
Kings Mtn. Manzanita *Arctostaphylos regismontana*	--/--/4	Chaparral, conifer forests.	Low	January-April
Brewer's calandrinia *Calandrinia breweri*	--/--/4	Burned and disturbed areas in coastal scrub and chaparral.	Low	March-June
Oakland star-tulip *Calochortus umbellatus*	--/--/4	Broad-leaved upland forests, chaparral, lower montane coniferous forests, grasslands, often on serpentine soils.	Low	March-May
San Francisco Bay spineflower *Chorizanthe cuspidata var. cuspidata*	FSC/--/1B	Coastal bluff scrub, coastal dunes, coastal prairie, on sandy soils.	Low	April-July
Franciscan thistle *Cirsium andrewsii*	--/--/4	Broad-leaved upland forests, coastal bluff scrub, sometimes on serpentine soils.	Low	June-July
San Francisco collinsia *Collinsia multicolor*	--/--/4	Closed-cone coniferous forests, coastal scrub.	Low	March-May

TABLE C-2 (Continued)
SPECIAL-STATUS SPECIES REPORTED OR POTENTIALLY OCCURRING NEAR THE PENINSULA AREA PROJECT SITES

Common name *Scientific name*	Listing Status USFWS/ CDFG/CNPS	Habitat Requirements	Potential to Occur[a]	Period of Identification / Flowering Period
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN (cont.)				
Plants (cont.)				
Clustered lady's-slipper *Cypripedium fasciculatum*	FSC/--/4	Lower montane coniferous forests, North Coast coniferous forests, usually serpentine soil seeps and streambanks.	Low	March-July
Mountain lady's-slipper *Cypripedium montanum*	FC3c/--/4	Broad-leaved upland forests, lower montane coniferous forests.	Low	March-July
Western leatherwood *Dirca occidentalis*	--/--/1B	Broad-leaved upland forests, closed-cone coniferous forests, chaparral, cismontane woodland, North Coast coniferous forests, riparian forests, riparian woodland, mesic sites.	Low-Moderate, suitable habitat may occur northwest of Pulgas Water Temple site.	January-April
California bottle-brush grass *Elymus californicus*	FC3c/--/4	North Coast coniferous forests.	Low	June-August
Marsh horsetail *Equisetum palustre*	--/--/3	Marshes.	Low	NK
Tiburon buckwheat *Eriogonum luteolum* var. *caninum*	FC3c/--/3	Chaparral, coastal prairie, grasslands, usually on serpentine soils.	Low	June-September
San Francisco wallflower *Erysimum franciscanum*	FSC/--/4	Coastal dunes, coastal scrub, grasslands, often on serpentine or granitic soils.	Low	March-June
Stink bells *Fritillaria agrestis*	--/--/4	Valley and foothill grasslands, oak woodlands; on clay flats; sometimes on serpentine soils.	Low, marginally suitable habitat may occur northwest of Pulgas Water Temple site.	March-April
Hillsborough chocolate lily *Fritillaria biflora var. ineziana*	--/--/1B	Cismontane woodland, grassland, on serpentine soils.	Low	March-April
Fragrant fritillary *Fritillaria liliacea*	FSC/--/1B	Coastal scrub, valley and foothill grassland, coastal prairie; on heavy clay soils, often on ultramafic soils.	Low	February-April
San Francisco gumplant *Grindelia hirsutula var. maritima*	FSC/--/1B	Coastal bluff scrub, coastal scrub, grasslands, on sandy or serpentine soils.	Low	August-September
Diablo rock-rose *Helianthella castanea*	FSC/--/1B	Openings in chaparral and broad-leaved upland forest.	Low	April-June
Kellogg's horkelia *Horkelia cuneata* ssp. *sericea*	FSC/--/1B	Closed-cone coniferous forests, coastal scrub.	Low	April-September
Crystal Springs lessingia *Lessingia arachnoidea*	FSC/--/1B	Cismontane woodland, coastal scrub, grasslands, on serpentine soils, often on roadcuts.	Low	July-October

TABLE C-2 (Continued)
SPECIAL-STATUS SPECIES REPORTED OR POTENTIALLY OCCURRING NEAR THE PENINSULA AREA PROJECT SITES

Common name *Scientific name*	Listing Status USFWS/ CDFG/CNPS	Habitat Requirements	Potential to Occur[a]	Period of Identification / Flowering Period
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN (cont.)				
Plants (cont.)				
Woolly-headed lessingia *Lessingia hololeuca*	--/--/3	Coastal scrub, lower montane coniferous forests, grasslands, usually on clay or serpentine soils.	Low	June-October
Bristly linanthus *Linanthus acicularis*	--/--/4	Chaparral, cismontane woodland, coastal prairie.	Low	April-July
Serpentine linanthus *Linanthus ambiguus*	--/--/4	Cismontane woodland, coastal scrub, grassland, usually on serpentine soils.	Low	March-June
Large-flower linanthus *Linanthus grandiflorus*	--/--/4	Coastal bluff scrub, closed-cone coniferous forests, cismontane woodland, coastal dunes, coastal prairie, coastal scrub, grasslands.	Low, marginally suitable habitat may occur northwest of Pulgas Water Temple site.	April-July
San Mateo tree lupine *Lupinus eximius*	FSC/--/3	Chaparral and coastal.	Low	April-July
Arcuate bush mallow *Malacothamnus arcuatus*	--/--/4	Chaparral.	Low	April-July
Robust monardella *Monardella villosa ssp. Globosa*	--/--/1B	Cismontane woodland, openings in chaparral.	Low	June-July
Dudley's lousewort *Pedicularis dudleyi*	FSC/CR/1B	North Coast coniferous forests, maritime chaparral, grasslands, sometimes in disturbed sites.	Low, marginally suitable habitat may occur northwest of Pulgas Water Temple site.	April-June
Gairdner's yampah *Perideridia gairdneri* ssp. *Gairdneri*	FSC/--/4	Broad-leaved upland forests, chaparral, valley and foothill grasslands, vernal pools, usually in mesic sites.	Low	June-October
White-flowered rein orchid *Piperia candida*	--/--/4	Lower montane coniferous forests, North Coast coniferous forests, sometimes on serpentine soils.	Low	May-August
Michael's rein orchid *Piperia michaelii*	--/--/4	Coastal bluff scrub, closed-cone coniferous forests, cismontane woodland, lower montane coniferous forests.	Low	May-August
Choris's popcorn-flower *Plagiobothrys chorisianus* var. *chorisianus*	--/--/3	Chaparral, coastal prairie, coastal scrub, on mesic sites.	Low	April-June
Hoffman's sanicle *Sanicula hoffmannii*	--/--/4	Broad-leaved upland forests, chaparral, coastal scrub, often on serpentine soils or clay.	Low	March-May

TABLE C-2 (Continued)
SPECIAL-STATUS SPECIES REPORTED OR POTENTIALLY OCCURRING NEAR THE PENINSULA AREA PROJECT SITES

Common name *Scientific name*	Listing Status USFWS/ CDFG/CNPS	Habitat Requirements	Potential to Occur[a]	Period of Identification / Flowering Period
FEDERAL OR STATE SPECIES OF SPECIAL CONCERN (cont.)				
<u>Plants (cont.)</u>				
Marin checkerbloom *Sidalcea hickmanii* ssp. *Viridis*	FSC/--/1B	Chaparral, usually on serpentine soils.	Low	May-June
San Francisco campion *Silene verecunda ssp. Verecunda*	FSC/--/1B	Coastal bluff scrub, chaparral, coastal prairie, coastal scrub, grasslands with sandy soil.	Low	March-June
San Francisco owl's-clover *Triphysaria floribunda*	FSC/--/1B	Coastal prairie and grasslands, on serpentine soils.	Low	April-May

STATUS CODES:

<u>Federal Categories (U.S. Fish and Wildlife Service)</u>

FE = Listed as Endangered by the Federal Government
FT = Listed as Threatened by the Federal Government
FPE = Proposed for Listing as Endangered
FPT = Proposed for Listing as Threatened
FC = Candidate for Federal Listing
FSC = Federal Species of Concern
BPA = Federal Bald Eagle Protection Act

<u>State Categories (California Department of Fish and Game)</u>

CE = Listed as Endangered by the State of California
CT = Listed as Threatened by the State of California
CR = Listed as Rare by the State of California

<u>California Native Plant Society (CNPS)</u>

List 1A = Plants presumed extinct in California
List 1B = Plants rare, threatened, or endangered in California and elsewhere
List 2 = Plants rare, threatened, or endangered in CA
List 3 = Plants about which more information is needed
List 4 = Plants of limited distribution

3511 = A Fully Protected Species
* = Special Animals
CSC = California Species of Special Concern

a High Potential = Species expected to occur and meets all habitats as defined in list.
Moderate Potential = Habitat only marginally suitable or suitable but not within species geographic range.
Low Potential = Habitat does not meet species requirements as currently understood in the scientific community.

b The bald eagle was proposed for delisting by the U.S. Fish and Wildlife Service on July 6, 1999.

-- = No listing status; NK = Not known, information unavailable.

SOURCES: CNDDB, 1999; CDFG, 1999

APPENDIX D

APPLICABLE CULTURAL RESOURCE LAWS AND REGULATIONS

CALIFORNIA ENVIRONMENTAL QUALITY ACT

HISTORICAL RESOURCES

The California Environmental Quality Act (CEQA) equates a substantial adverse change in the significance of a historical resource with a significant effect on the environment (Section 21084.1 of the Public Resources Code) and defines substantial adverse change as demolition, destruction, relocation, or alteration that would impair historical significance (Section 5020.1). Section 21084.1 stipulates that any resource listed in, or eligible for listing in, the *California Register of Historical Resources* (CRHR) is presumed to be historically or culturally significant.

Resources listed in a local historic register or deemed significant in a historical resource survey (as provided under Section 5024.1g) are presumed historically or culturally significant, unless the preponderance of evidence demonstrates they are not. A resource that is not listed in, or determined to be eligible for listing in, the CRHR, not included in a local register of historic resources, or not deemed significant in a historical resource survey may nonetheless be historically significant (Section 21084.1). Public Resources Code Section 21098.1 stipulates:

> A project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. For the purposes of this section, an historical resource is a resource listed in, or determined to be eligible for listing in, the California Register of Historical Resources. Historical resources included in a local register of historical resources, as defined in subsection (k) of Section 5020.1...are presumed to be historically or culturally significant for purposes of this section, unless the preponderance of the evidence demonstrates that the resource is not historically or culturally significant. The fact that a resource is not listed in, or determined to be eligible for listing in, the California Register of Historical Resources, not included in a local register of historical resources, or not deemed significant pursuant to criteria set forth in subdivision (g) of Section 5024.1...shall not preclude a lead agency from determining whether the resource may be an historical resource for purposes of this section.

Public Resources Code Sections 5020.1 and 5024.1 provide the following definitions:

- *Historic district* means a definable, unified geographic entity that possesses a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development.

- *Historical landmark* means any historical resource registered as a state historical landmark pursuant to Section 5021.

- *Historical resource* includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript that is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California.

- *Local register of historic resources* means a list of properties officially designated or recognized as historically significant by a local government pursuant to a local ordinance or resolution.

- *Substantial adverse change* means demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired.

A resource identified as significant in a historical resource survey may be listed in the CRHR if the survey meets all of the following criteria:

- The survey has been or will be included in the State Historic Resources Inventory.

- The survey and the survey documentation were prepared in accordance with Office of Historic Preservation procedures and requirements.

- The resource is evaluated and determined by the Office of Historic Preservation to have a significance rating of Category 1 to 5 on Department of Parks and Recreation Form 523.

- If the survey is five or more years old at the time of its nomination for inclusion in the CRHR, the survey is updated to identify historical resources that have become eligible or ineligible due to changed circumstances or further documentation and historical resources that have been demolished or altered in a manner that substantially diminishes their significance.

ARCHAEOLOGICAL RESOURCES

CEQA requires the lead agency to identify and examine the significant adverse environmental effects that may result from such projects. New guidelines became effective January 1, 1999 (see below). Where a project may adversely affect a unique archaeological resource, Section 21083.2 requires the lead agency to treat that effect as a significant environmental effect and prepare an environmental impact report. When an archaeological resource is listed in or eligible to be listed in the CRHR, Section 21084.1 requires that any substantial adverse effect to that resource be considered a significant environmental effect. Sections 21083.2 and 21084.1 operate independently to ensure that potential effects on archaeological resources are considered as part of a project's environmental analysis. Either of these benchmarks may indicate that a proposal may have a potential adverse effect on archaeological resources.

Public Resources Code 21083.2 (g) defines a unique archaeological resource to be:

> An archaeological artifact, object, or site, about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it

> meets any of the following criteria: (1) contains information needed to answer important scientific research questions, and there is a demonstrable public interest in that information, (2) has a special and particular quality such as being the oldest of its type or the best available example of its type, or (3) is directly associated with a scientifically recognized important prehistoric or historic event or person.

Section 21084.1 requires treatment of any substantial adverse change in the significance of a historical resource listed in, or eligible to be listed in, the CRHR as a significant effect on the environment. The definition of "historical resource" includes archaeological resources listed in or formally determined eligible for listing in the CRHR and, by reference, the *National Register of Historic Places*, California Historical Landmarks, Points of Historical Interest, and local registers (see Section 5020.1 and 5024.1 definitions above).

Prior to January 1, 1999, the CEQA Guidelines included Appendix K, which took a broader approach, using the term "important" in place of "unique." The definition of archaeological impacts under Appendix K went beyond that in Section 21083.2, suggesting additional criteria to guide the lead agency in making a determination of uniqueness: the resource must be at least 100 years old and possess "substantial stratigraphic integrity," and the resource must involve "important" research questions that historical research has shown can be answered only with archaeological methods. Relevant guidance previously provided in Appendix K was moved into CEQA Guidelines Sections 15064.5 and 15126.4. To resolve conflicts between the narrow and limiting statutory provision for mitigation of archaeological resources and the broadly protective statutory provision for determining the significance of historical resources, Section 15064.5(c) provides that, to the extent an archaeological resource is also an historical resource, the provisions regarding historical resources apply. These new provisions endorse the first set of standardized mitigation measures for historic resources by providing that projects following the Secretary of the Interior's *Standards for Treatment of Historic Properties* shall be considered as mitigated to a less than significant level.

Other provisions of the CEQA Guidelines indicate that, in many circumstances, the often used method of mitigating impacts to historical resources by way of documentation (e.g., narrative, photographs, architectural drawings) will not mitigate the impacts to a level where no significant effect on the environment would occur. In CEQA Guidelines Section 15331, a new categorical exemption is added for projects limited to restoration or rehabilitation of historic resources consistent with the Secretary of the Interior's *Standards for Treatment of Historic Properties* (Gorsen, 1999).

CEQA Guidelines Appendix G, Environmental Checklist Form, lists among significant effects of a project that it will: "disrupt or adversely affect a prehistoric or historic archaeological site or property of historic or cultural significance to a community or ethnic or social group except as part of a scientific study."

NATIVE AMERICAN BURIALS — OTHER CALIFORNIA LAWS AND REGULATIONS

Other state-level requirements for cultural resources management are written into the California Public Resources Code Chapter 1.7, Section 5097.5 (Archaeological, Paleontological, and Historical Sites), and Chapter 1.75, beginning at Section 5097.9 (Native American Historical, Cultural, and Sacred Sites) for lands owned by the state or a state agency.

The disposition of Native American burials is governed by Section 7050.5 of the California Health and Safety Code and Sections 5097.94 and 5097.98 of the Public Resources Code and fall within the jurisdiction of the Native American Heritage Commission (NAHC). If human remains are discovered, the county coroner must be notified within 48 hours, and there should be no further disturbance to the site where the remains were found. If the remains are determined by the coroner to be Native American, the coroner is responsible for contacting the NAHC within 24 hours. The NAHC, pursuant to Section 5097.98, would immediately notify those persons it believes to be most likely descended from the deceased Native American so they can inspect the burial site and make recommendations for treatment or disposal.

FEDERAL STATUTES AND REGULATIONS

The National Historic Preservation Act (NHPA) of 1966 (as amended) established the federal government's policy on historic preservation and the programs, including the National Register of Historic Places, through which that policy is implemented. Under the NHPA, historic properties include ". . . any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places" (16 United States Code [USC] 470w [5]). Section 106 (16 USC 470f) of the NHPA requires federal agencies, prior to implementing an "undertaking" (e.g., issuing a federal permit), to consider the effects of the undertaking on historic properties and to afford the Advisory Council on Historic Preservation and the State Historic Preservation Office a reasonable opportunity to comment on any undertaking that would adversely affect properties eligible for listing on the *National Register of Historic Places*.

If a Clean Water Act Section 404 permit is required for construction (wetland fills or crossings), the NHPA of 1966 (as amended) and its implementing regulations (16 USC 470 et seq., 36 CFR Part 800, 36 CFR Part 60, and 36 CFR Part 63) also apply. The U.S. Army Corps of Engineers, as lead federal agency for issuing the Section 404 permit, would be the lead agency for NHPA Section 106 compliance, and consultation with the State Historic Preservation Office and the Advisory Council on Historic Preservation would be required.

APPENDIX E
HAZARDOUS SUBSTANCES REGULATORY FRAMEWORK

Hazardous materials and hazardous wastes are extensively regulated by various federal, state, regional, and local regulations, with the major objective of protecting public health and the environment. The major regulations are presented below. A database search was conducted to identify permitted hazardous materials usage and environmental cases within a one-mile radius of each of the proposed project sites. This appendix also presents a summary of the agency lists that were reviewed. The date of each agency list reviewed is identified in Table E-1.

FEDERAL REGULATIONS

The U.S. Environmental Protection Agency (USEPA) is the lead agency responsible for enforcing federal regulations that affect public health or the environment. The primary federal laws and regulations include: the Resource Conservation and Recovery Act of 1974 (RCRA); the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA); and the Superfund Act and Reauthorization Act of 1986 (SARA). Federal statutes pertaining to hazardous materials and wastes are contained in the Code of Federal Regulations (40 CFR).

RCRA was enacted in 1974 to provide a general framework for the national hazardous waste management system, including the determination of whether hazardous wastes are being generated, techniques for tracking wastes to eventual disposal, and the design and permitting of hazardous waste management facilities. The Hazardous and Solid Waste Amendment was enacted in 1984 to better address hazardous waste; this amendment began the process of eliminating land disposal as the principal hazardous waste disposal method. Other specific areas covered by the amendment include regulation of carcinogens, listing and delisting of hazardous wastes, permitting for hazardous waste facilities, and leaking underground storage tanks.

CERCLA, also known as Superfund, was enacted in 1980 to ensure that a source of funds was available to clean up abandoned hazardous waste sites, compensate victims, address releases of hazardous materials, and establish liability standards for responsible parties. SARA amended CERCLA in 1986 to increase the Superfund budget, modify contaminated site cleanup criteria and schedules, and revise settlement procedures. SARA also provides a regulatory program and fund for underground storage tank cleanups and the Emergency Planning and Community Right-to-Know Program (EPCRA).

Title 40 of the Code of Federal Regulations, Section 112 also contains requirements for aboveground storage of petroleum products. In accordance with these regulations, a petroleum

TABLE E-1
SUMMARY OF DATABASES REVIEWED FOR EACH CONSTRUCTION SITE

Name of List	Responsible Agency	Acronym	Date of List
National Priority List	USEPA	NPL	July 1999
Comprehensive Environmental Response, Compensation, and Liability Information System	USEPA	CERCLIS	May 1999
California CERCLIS	USEPA	CalCERCLIS	June 1995
CERCLIS-NFRAP	USEPA	NFRAP	May 1999
Toxic Release Inventory System	USEPA	TRIS	Jan. 1998
Emergency Response Notification System	USCG	ERNS	Dec. 1998
RCRA Facilities	USEPA	RCRA-TSD	May 1999
RCRA Large Quantity Generator	USEPA	RCRA-LgGen	May 1999
RCRA Small Quantity Generator	USEPA	RCRA-SmGen	May 1999
RCRA Enforcement Actions	USEPA	RCRA Viols/Enf	May 1999
RCRA Corrective Action Sites	USEPA	CORRACTS	May 1999
Annual Work Plan	DTSC	SPL	Apr. 1999
Cal Sites	DTSC	SCL	Apr. 1999
Deed Restrictions Properties Report	DHS	Deed Restrictions	Apr. 1994
Leaking Underground Storage Tanks	RWQCB	LUST Reg2	Jun. 1999
Leaking Underground Storage Tanks	RWQCB	LUST Reg5	Apr. 1999
LUST Information System	Cal EPA	LUST	Apr. 1999
North and South Bay SLIC List	RWQCB	LUST	Jan. 1998
Central Valley SLIC/DOD/DOE List	RWQCB	LUST	Mar. 1999
Wase Management Unit Discharge Systems	RWQCB	WMUDS	Feb. 1999
North Bay County Toxic List	RWQCB	North Bay	Apr. 1994
South Bay Site Management System	RWQCB	South Bay	Apr. 1994
Hazardous Waste Substance Site List	Office of Planning and Research	CORTESE	Apr. 1998
Solid Waste Information System	CA IWMB	SWLF	Apr. 1999
Summary of Toxic Pits Clean-Up Facilities	RWQCB	Toxic Pits	Feb. 1995

TABLE E-1 (Continued)
SUMMARY OF DATABASES REVIEWED FOR EACH CONSTRUCTION SITE

Name of List	Responsible Agency	Acronym	Date of List
Underground Storage Tank (UST) Registrations Database	SWRCB	UST	Jan. 1994
Alameda County UST List	Department of Environmental Health	UST	Sep. 1998
San Mateo County UST List	Environmental Health	UST	Apr. 1998
San Joaquin County UST List	Environmental Health Division	UST	Jan. 1999
Aboveground Storage Tank Database	SWRCB	AST	Dec. 1998
Water Wells	USGS	Water Wells	Mar. 1998

tank of greater than 660 gallons or aggregate storage of over 1,320 gallons, which could reasonably discharge to a navigable water, is required to have a Spill Control and Countermeasure Plan. (EPA Region IX, San Francisco, has taken the conservative stance that virtually any large oil spill in California will enter federally regulated waters.) The plan would include appropriate spill containment or equipment used to divert spills from sensitive areas, a discussion of facility-specific requirements for the storage system, inspections and a recordkeeping system, security for the system, and personnel training.

The federally published lists of sites that trace the status of suspected hazardous materials sites or identify sites permitted to generate hazardous wastes include:

- The National Priority List (NPL), which prioritizes sites with significant risk to human health and the environment;
- The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), which tracks contaminated properties identified under CERCLA and SARA;
- The CalCERCLIS database containing utility descriptions for California CERCLIS sites;
- The CERCLIS-NFRAP database, which lists sites where, following an initial investigation, no contamination was found, contamination was removed quickly, or the contamination was not serious enough to require federal Superfund action or NPL consideration;

- The toxic chemical release inventory, which identifies sites that have reported a chemical release to the air, water, or land as required by Title III of the Superfund Amendments and Reauthorization Act of 1986 (TRIS);

- The Emergency Response Notification System (ERNS), which identifies spills of oil or hazardous substances reported pursuant to Section 103 of CERCLA as amended, Section 311 of the Clean Water Act, and Sections 300.51 and 300.65 of the National Oil and Hazardous Substances Contingency Plan;

- RCRA Information System, which includes facilities permitted to handle hazardous wastes under RCRA including treatment, storage, and disposal facilities (RCRA - TSD); large-quantity generators that report generation of greater than 1,000 kilograms/month of non-acutely hazardous waste or 1 kilogram/month of acutely hazardous waste (RCRA-LgGen); small-quantity generators that report generation of less than 1,000 kilograms/month of non-acutely hazardous waste or 1 kilogram/month of acutely hazardous waste (RCRA-SmGen); and facilities that have been cited by the USEPA for RCRA violations at least once since 1980 (RCRA Viols/Enf); and

- Resource Conservation and Recovery Act (RCRA) Corrective Action Sites (CORRACTS). This list, maintained by the USEPA, includes RCRA-permitted facilities that are undergoing corrective action. A corrective action order is issued pursuant to RCRA Section 3008(h), when there has been a release of hazardous waste or constituents into the environment from a RCRA facility. Corrective actions may be required beyond the facility's boundary and can be required regardless of when the release occurred, even if it predates RCRA.

STATE AND REGIONAL REGULATIONS

The USEPA has delegated much of its regulatory authority to the individual states. The Department of Toxic Substances Control (DTSC) of the California Environmental Protection Agency (Cal EPA), formerly a division of the Department of Health Services, enforces hazardous materials and waste regulations in California, in conjunction with the USEPA. The DTSC is responsible for regulating the management of hazardous substances, including the remediation of sites contaminated by hazardous substances. California hazardous materials laws incorporate federal standards, but are often stricter than federal laws. The primary state laws include: the California Hazardous Waste Control Law (HWCL), the state equivalent of RCRA; and the Carpenter-Presley-Tanner Hazardous Substance Account Act (HSAA), the state equivalent of CERCLA. State hazardous materials and waste laws are contained in the California Code of Regulations, Titles 22 and 26.

The HWCL, enacted in 1972 and administered by the DTSC, is the basic hazardous waste statute in California and has been amended several times to address current needs, including bringing the state law and regulations into conformance with federal laws. This act implements the RCRA cradle-to-grave waste management system in California, but is more stringent in its regulation of non-RCRA wastes, spent lubricating oil, small-quantity generators, transportation and permitting requirements, as well as penalties for violations. The HWCL also exceeds federal requirements by mandating the recycling of certain wastes, requiring certain generators to document a hazardous waste source reduction plan, requiring permitting for federally exempt treatment of

hazardous wastes by generators, and stricter regulation of hazardous waste facilities.

The HSAA, enacted in 1981, addresses similar concerns as CERCLA. The primary difference is in how liability is assigned for a site with more than one responsible party. This is important for petroleum cleanup sites, because federal law is typically used to force responsible-party cleanups; state law is used for petroleum cleanup sites that are CERCLA-exempt.

Other relevant state statutes include:

- The Toxic Pit Cleanup Act of 1984 and the Toxic Injection Well Act of 1985, which were established to provide a regulatory framework for open pits or injection wells as a means of hazardous waste or disposal;

- The Hazardous Waste Management Act of 1986, which coordinates the state's implementation of federal landfill bans and authorizes landfill bans for non-RCRA hazardous wastes;

- The Aboveground Petroleum Storage Act of 1989, which requires the owner or operator of aboveground petroleum storage tanks to file a storage statement with the State Water Resources Control Board (SWRCB), if tank storage exceeds 10,000 gallons and holds petroleum or petroleum product that is liquid at ambient temperatures. In addition, the tank or tanks must be registered if they are subject to federal requirements; this potentially expands the requirement for a storage statement to any tank over 660 gallons or aggregate storage of 1,320 gallons;

- The Hazardous Waste Source Reduction and Management Act, which required large-quantity generators to document hazardous wastes being generated and to prepare a waste reduction plan beginning in 1991;

- The Hazardous Waste Treatment Permitting Reform Act of 1992, which required a permit for any hazardous waste treatment by a generator beginning on April 1, 1993. This statute established a new tiered permitting program whereby on-site treatment facilities are permitted or authorized to operate subject to different levels of regulatory requirements, depending on the nature and size of the treatment activity. Amendments to this statute adopted in 1993-1996 have enacted certain exemptions and modified compliance requirements; and

- The Hazardous Waste Management Reform Act of 1995, which required the DTSC to revise its regulations to more closely conform to federal hazardous waste identification criteria and essentially eliminate land disposal restrictions for California-only hazardous wastes, among other major changes. However, many of these changes have been deferred to a DTSC advisory committee for further study and are not expected to be implemented for several years, and in certain cases, not at all.

The published lists of sites, which trace remediation progress within the state, include:

- The Annual Work Plan, formerly known as the Bond Expenditure Plan (SPL), which is a site-specific expenditure plan for the appropriation of California Hazardous Substance Cleanup Bond Act of 1984 funds. This list is no longer updated; and

- Cal Sites (SCL), which was previously referred to as the Abandoned Sites Program Information System (ASPIS), and identifies potential hazardous waste sites, which are then screened by the DTSC. Sites on this list that are designated for no further action by the DTSC were not identified by the database review.

The California Department of Health Services–Land Use and Air Assessment agency also maintains the Deed Restriction Properties Report, which lists sites that have entered voluntary deed restrictions. These restrictions are agreements with owners of property who propose building residences, schools, hospitals, or day care centers on property that is on or within 2,000 feet of a significant disposal of hazardous waste.

The Regional Water Quality Control Board (RWQCB) is authorized by the State Water Resources Control Board to enforce provisions of the Porter-Cologne Water Quality Control Act of 1969. This act gives the RWQCB authority to require groundwater investigations when the quality of groundwater or surface waters of the state is threatened, and to require remediation of the site, if necessary. Both of these agencies are part of the Cal EPA.

The RWQCB maintains the following lists identifying hazardous waste sites that were reviewed:

- The Leaking Underground Storage Tanks list (LUST or LUST Reg2, Reg5) and LUST Information System, which track remediation status of known leaking underground tanks;

- The North Bay Spill, Leak, Investigations, and Cleanups list and Central Valley CLIC/DOD/DOE list (LUST), which include various hazardous waste sites within the jurisdiction of the San Francisco Bay RWQCB and Central Valley RWQCB;

- The Waste Management Unit Discharge System (WMUDS) list of sites, which tracks waste management units. The list contains sites identified on the Toxic Pits List, which is required by the Toxic Pits Cleanup Act (Katz Bill), and places relatively strict limitations on the discharge of hazardous wastes into surface impoundments, toxic ponds, pits, and lagoons (the RWQCB is required to inspect all surface impoundments annually). The WMUDS list also identifies sites targeted by the Solid Waste Assessment Program where there is a possible risk of solid waste disposal sites (landfills) discharging hazardous wastes, threatening either water or air quality; and

- The North Bay County Toxic List–Region #2 Surface Spills and South Bay Site Management System track additional sites under the jurisdiction of the RWQCB.

The Bay Area Air Quality Management District (BAAQMD) may impose specific requirements on remediation activities to protect ambient air quality from dust or other airborne contaminants.

The California Governor's Office of Planning and Research annually publishes a listing of potential and confirmed hazardous waste sites throughout California (CORTESE). This database includes input from many state databases.

The California Integrated Waste Management Board maintains a list of active, inactive, or closed solid waste disposal sites and transfer facilities, as legislated under the Solid Waste Management and Resource Recovery Act of 1972. The list is referred to as the Solid Waste Information

System (SWLF). The RWQCB maintains the Summary of Toxic Pits Clean Up Facilities (Toxic Pits).

The SWRCB also requires registration of aboveground storage tanks subject to federal regulations and permitting of all underground storage tanks (USTs) containing hazardous substances. The California laws regulating USTs are primarily found in the Health and Safety Code; combined with regulations adopted by the State Water Board, these laws comprise the requirements of the state UST program. The laws contain requirements for UST permitting, construction, installation, leak detection monitoring, repairs and upgrades, corrective actions, and closures. In accordance with state laws, counties are required to implement a UST program and, in some cases, the county requirements are more stringent than those of the state. Cities are also given the option to implement a UST program. The RWQCB may also oversee corrective actions. Permitted aboveground and underground storage tanks were identified in the Aboveground Storage Tank Database and Underground Storage Tank Registration Database (AST and UST).

The United States Geological Survey maintains the USGS Water Wells database (Water Wells), which contains information for over 100,000 wells and other sources of groundwater the USGS has studied, used, or otherwise had reason to document through the course of research.

LOCAL REGULATIONS

In accordance with Senate Bill 1082 (Health and Safety Code 25404), administration and enforcement of major environmental programs was transferred to local agencies as Certified Unified Program Agencies (CUPAs) beginning in 1996. The purpose of this legislation was to simplify environmental reporting by streamlining the number of regulatory agency contacts a facility must maintain and requiring the use of more standardized forms and reports. In San Mateo County (Pulgas Water Temple, Crystal Springs Balancing Reservoir, and Harry W. Tracy WTP sites), the Environmental Health Services Department is the administering agency for the CUPA program. In San Joaquin County (Tesla Portal site), the Public Health Services, Environmental Health Division and the County Office of Emergency Services are the administering agencies. In Alameda County (Sunol Valley sites), the Environmental Health Services is the administering agency for the CUPA program. As the CUPA, they are responsible for the following environmental programs:

- Hazardous Materials Business Plans;
- Risk Management Prevention Program for Acutely Hazardous Materials;
- Uniform Fire Code - Article 80, 103 b and c of the 1991 Fire Code (Hazardous Materials);
- Underground Storage Tanks;
- Aboveground Storage Tanks; and
- Hazardous Waste On-Site Treatment by Generators.

As part of the UST program, the Environmental Health Services Department and/or Division for each of the counties is responsible for issuing operating and closure permits for USTs and overseeing such tasks as UST design plans, construction, monitoring, leak reporting, and closure.

They also oversee remediation of contaminated soil and groundwater at leaking underground storage tank sites in coordination with Cal-EPA.

Among other agencies enforcing regulations pertaining to the storage of hazardous materials are:

- The California Department of Forestry (CDF) for the Pulgas Water Temple and Harry W. Tracy WTP sites;
- The San Joaquin Fire Marshall Office and Tracy Consolidated Fire District for the Tesla Portal site; and
- The Alameda County Fire Department for the San Antonio Pump Station site.

These agencies require a permit for any UST installation, modification, or closure. In addition, they enforce Title 79 and Appendix IIF of the 1994 Uniform Fire Code and California Fire Code, which pertain to the storage of flammable and combustible liquids, as well as Appendix IIB which pertains to the storage of flammable liquids in tanks located in areas subject to flooding.

HAZARDOUS MATERIALS MANAGEMENT

HAZARDOUS MATERIALS BUSINESS PLANS AND INVENTORIES

California requires submission of a Business Plan to the local administering agency (see previous paragraph) for businesses that handle hazardous materials over certain threshold quantities. This document is used by the city and county for chemical emergency planning. The Business Plan includes an inventory of hazardous materials used at the site. However, the state definition of a hazardous material includes many chemicals that are common and not very hazardous. The Business Plan is required to include:

- specific details on the business, such as name and address;
- an inventory of hazardous materials used and stored;
- a site and facility layout;
- emergency response procedures;
- procedures for immediate notification of the administering agency in the event of an emergency;
- evacuation plans in the event of an emergency;
- a description of the training employees have received in evacuation and safety procedures; and
- identification of local emergency medical assistance.

HAZARDOUS MATERIALS WORKER SAFETY REQUIREMENTS

The federal Occupational Safety and Health Administration (OSHA) and the California Safety and Health Administration (Cal-OSHA) are the agencies responsible for assuring worker safety in

the handling and use of chemicals in the workplace. The federal regulations pertaining to worker safety are contained in the Code of Federal Regulations, Title 29 (29 CFR) as authorized in the Occupational Safety and Health Act of 1970. They provide standards for safe workplaces and work practices, including standards relating to hazardous materials handling. In California, Cal-OSHA assumes primary responsibility for developing and enforcing workplace safety regulations; Cal-OSHA standards are generally more stringent than federal regulations.

The state regulations concerning the use of hazardous materials in the workplace are included in Title 8 of the California Code of Regulations, which contain requirements for safety training, availability of safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. Cal-OSHA also enforces hazard communication program regulations, which contain worker safety training and hazard information requirements, such as procedures for identifying and labeling hazardous substances, communicating hazard information relating to hazardous substances and their handling, and preparation of health and safety plans to protect workers and employees at hazardous waste sites.

ASBESTOS ABATEMENT REGULATIONS

Where demolition or renovation work will involve 100 square feet or more of asbestos-containing materials, state law requires that the contractor be certified and that certain procedures be followed.[1] Section 19827.5 of the California Health and Safety Code, adopted January 1, 1991, requires that local agencies not issue demolition permits until an applicant has demonstrated compliance notification requirements under applicable federal regulations regarding hazardous air pollutants, including asbestos.

The BAAQMD is vested by the California legislature with authority to regulate airborne pollutants, including asbestos, through both inspection and law enforcement. They are to be notified ten days in advance of any proposed demolition. Notification includes the names, addresses, and phone numbers of operations and persons responsible, including the contractor; description and location of the structure to be renovated/demolished, including size, age, and prior use, and the approximate amount of friable asbestos scheduled; starting and completion dates of demolition, nature of planned work, and methods to be employed; procedures to be employed to meet BAAQMD requirements; and the name and location of the waste disposal site to be used.

1 Assembly Bill 2040, Asbestos 1985, added Section 24223 and Chapter 25 to Division 20 of the Health and Safety Code.

According to the BAAQMD Regulation 11, Rule 2, if a structure is to be demolished, friable and potentially friable asbestos must be removed and disposed of properly. Workers and the public could become exposed to asbestos fibers, as they become airborne during removal.[2]

The local office of Cal-OSHA must be notified of asbestos abatement to be carried out. Asbestos contractors must follow state regulations contained in Title 8 of the California Code of Regulations, Sections 1529 and 341.6 through 341.14, where there is asbestos-related work involving 100 square feet or more of asbestos-containing materials. Asbestos removal contractors must be certified as such by the Contractors Licensing Board of the State of California. Pursuant to California law, the required permit would not be issued until the applicant has complied with the notice requirements as well as requirements for proper waste disposal (described below).

LEAD-BASED PAINT ABATEMENT REGULATIONS

In accordance with regulatory guidance, lead-based paint waste that has been separated from building materials (such as delaminated or chipping paint) must be evaluated separately from other building materials for waste disposal purposes during building demolition. Accordingly, any chipping or delaminated paint would need to be removed before any renovation or demolition activities. Depending on the level of lead identified in the paint, it may require disposal as a hazardous waste. Building materials that still have the paint adhered to them may generally be disposed of as regular construction debris, regardless of the lead level in the paint.

The Lead in Construction Standard contained in Title 29 of the Code of Federal Regulations, Section 1926.62 applies to the removal of chipping or delaminated lead-based paint. In accordance with this standard, it is necessary for workers to wear respiratory protection until the work is completed or until an employee exposure assessment can demonstrate that air lead levels during scraping are below the permissible exposure limit (PEL). Other applicable requirements of the standard include worker awareness training, use of protective clothing, provisions for change areas and hand-washing facilities, biological monitoring, and development of a site-specific compliance program. California regulations (Title 8 of the California Code of Regulations, Section 1532.1) relating to the abatement of lead-based paint are similar to the federal regulations.

WASTE DISPOSAL REGULATIONS

All California landfills have been segregated by regulatory authority into the categories of Class I, Class II, and Class III facilities. Class I facilities can accept hazardous wastes with chemical levels below the federal land disposal restriction (land ban) treatment standards. Class II and III facilities can accept nonhazardous wastes that meet acceptance criteria determined by the state for organic and inorganic compounds; each landfill has individual acceptance criteria.

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2 Bay Area Air Quality Management District, Rules and Regulations, Regulation 11, Rule 2, *Asbestos Demolition, Renovation and Manufacturing*, adopted May 1981.

The disposal of soil is regulated by the RWQCB and is predicated on the concentrations of the chemical constituents that are present. Soil with total petroleum hydrocarbon or organic compound concentrations above the detection limit must be disposed of at an appropriate landfill facility or treated to reduce the levels of chemicals in the soil; the concentration of the compounds present determines the appropriate type of disposal facility. In general, soil with total petroleum hydrocarbon levels up to 100 milligrams per kilogram can be disposed of at a Class III disposal facility. If the concentration is between 100 and 1,000 milligrams per kilogram, soil can be disposed of at a Class II disposal facility; if the concentration is greater than 1,000 milligrams per kilogram, Class I disposal would be required.

The disposal alternative is also predicated on the total and soluble concentrations of metals. Soil with total metal concentrations that are above the Total Threshold Limit Concentration (TTLC) and soluble metal concentrations that are above the Soluble Threshold Limit Concentration (STLC) must be disposed of at a Class I disposal facility or treated.[3] The Class II and III landfills in the Bay Area have acceptance criteria for lead that are lower than the STLC.

Soil with no concentrations of organic chemicals above detection limits and total and soluble metal concentrations that are below the TTLC and STLC may be used onsite or transported offsite as unrestricted waste.

Lead-based paint is considered a hazardous waste because the total lead concentration would be greater than the TTLC of 1,000 milligrams per kilogram. It would be necessary to dispose of the paint at a Class I facility.

The California DTSC has classified friable, finely divided and powdered wastes containing greater than 1 percent asbestos as a hazardous waste.[4] A friable waste can be reduced to powder or dust under hand pressure when dry. Nonfriable asbestos-containing wastes are not considered hazardous and are not subject to regulation under Title 22, Division 4.5 of the California Code of Regulations. The management of these wastes would still be subject to any requirements or restrictions, that may be imposed by other regulatory agencies. The state standard for classification of asbestos wastes is contained in Section 66261.24 of Title 22 of the California Code of Regulations. Asbestos is not currently regulated as a hazardous waste under RCRA; because of this, it is considered a non-RCRA waste. Asbestos wastes totaling more than 50 pounds must be transported by a registered waste hauler to an approved treatment, storage, or disposal facility.

Wastes containing asbestos may be disposed of at any landfill that has waste discharge

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3 The total threshold limit concentration (TTLC) and the soluble threshold limit concentration (STLC) are criteria used for waste classification purposes. If the waste contains a total concentration of a constituent and a concentration greater than the TTLC, it is considered a hazardous waste. If the total concentration is greater than ten times the STLC, then it would be necessary to perform a waste extraction test to determine the soluble concentration. If the soluble concentration is greater than the STLC, the waste would be considered hazardous. The waste extraction test involves a ten times dilution of the sample; because of this, it would be impossible for the soluble concentration to exceed the STLC unless the total concentration exceeded ten times the STLC.

4 California Department of Toxic Substances Control, *Fact Sheet, Asbestos Handling, Transport and Disposal*, October 1993.

requirements issued by the RWQCB and that allows disposal of asbestos-containing materials, provided that the wastes are handled and disposed of in accordance with the Toxic Substances Control Act, the Clean Air Act's National Emission Standards for Hazardous Air Pollutants, and Title 22 of the Code of California Regulations (Division 4.5). The DTSC also has treatment standards for asbestos-containing wastes, which require submittal of a notification and certification form to the land disposal facility as well as wetting and containment of the asbestos-containing materials.

The owners of properties where hazardous wastes are produced or abatement would occur must have a hazardous waste generator number assigned by and registered with the California DTSC in Sacramento. The contractor and hauler of the material are required to file a Hazardous Waste Manifest, which details the hauling of the material from the site and the disposal of the material.

APPENDIX F

GLOSSARY AND LIST OF ACRONYMS AND ABBREVIATIONS

ABAG – Association of Bay Area Governments.

ACCELERATION – Acceleration is the rate of increase in velocity. It is typically scaled against a value that everyone is familiar with, such as , acceleration due to gravity or the acceleration with which a ball falls if released at rest in a vacuum (1.0g). Acceleration of 1.0g is equivalent to a car traveling 100 meters (328 feet) from rest in 4.5 seconds. Acceleration is expressed by a "g" which is gravity = 980 centimeters per second squared.

ac-ft – acre-feet.

AESTIVATION – In zoology, a state of dormancy or torpor during the summer experienced by some animals as opposed to hibernation.

ALGAL BLOOM – Excessive growth of algae that occurs when a natural body of water receives high concentrations of dissolved nutrients.

ALQUIST-PRIOLO EARTHQUAKE FAULT ZONE – The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. In accordance with this act, the State Geologist established regulatory zones called "earthquake fault zones" around the surface traces of active faults and published maps showing these zones. Within these zones, buildings for human occupancy cannot be constructed across the surface trace of active faults. Each earthquake fault zone extends approximately 200 to 500 feet on either side of the mapped fault trace.

AMBIENT NOISE LEVEL – The total noise in a given environment independent of a specific noise source to be measured; "residual" or "background" noise.

ASCE – American Society of Civil Engineers.

ASJRR – Alameda and San Joaquin Railroad.

AWWA – American Water Works Association.

BAAQMD – Bay Area Air Quality Management District.

BART – Bay Area Rapid Transit.

BAWUA – Bay Area Water Users Association.

BENEFICIAL USE – A regulatory definition of uses of the surface water and groundwater of the State of California that include: municipal and industrial uses, contact and noncontact recreation, fishing, and fish and wildlife habitat, among others.

BMPs – Best Management Practices.

CAL/OHP – California (State of), Office of Historic Preservation under the Department of Parks and Recreation.

CALTRANS – California Department of Transportation.

CAUSTIC – A chemical with high pH or alkaline characteristics, such as sodium hydroxide.

CCSF – City and County of San Francisco, or the City

CDD – City Distribution Division of the San Francisco Public Utilities Commission, which is responsible for storage and distribution of drinking water within the City.

CDFG – California Department of Fish and Game.

CDMG – California Department of Mines and Geology.

CEQA – California Environmental Quality Act.

CESA – California Endangered Species Act.

CFR – Code of Federal Regulations.

CHLORAMINE – A combination of chlorine and ammonia used as a disinfectant.

CHLORAMINATION – A disinfection process that involves the addition of chloramine.

CHLORINATION – A disinfection process that involves the addition of free chlorine, whether as chlorine gas or liquid sodium hypochlorite.

CIP – Capital Improvement Program.

CNDDB – California Natural Diversity Data Base.

CNPS – California Native Plant Society.

COMMUNITY NOISE EQUIVALENT LEVEL (CNEL) – A method for predicting, by a single number rating, cumulative noise that affects communities. The CNEL value represents noise as measured by an A-weighted sound level meter, but includes a 5-decibel penalty for evening hours (7 p.m. to 10 p.m.) and a 10-decibel penalty for nighttime hours (10 p.m. to 7 a.m.). The A-weighted decibel scale was developed to closely represent the response of the human ear to sound.

CONTACTOR BASIN/PIPELINE – A large reservoir or long pipeline used in the treatment process to provide adequate time ("contact") for chemical processes to occur.

CORPS – U.S. Army Corps of Engineers.

cm/sec – centimeters per second.

CRCV – Coast Range / Central Valley.

CRHR – California Register of Historical Resources.

CUT-AND-FILL – The construction process involving excavation of soils, usually hillsides, known as "cut," and placing the soil in other locations, usually depressed areas, known as "fill."

D/DBP Rule – Disinfectants and Disinfection By-Products Rule. A federal drinking water regulation adopted by the USEPA. The Stage 1 D/DBP Rule was adopted in December 1998 and became effective in February 1999. The Stage 1 D/DBP Rule reduces the maximum allowable levels of disinfectants and disinfection by-products in drinking water supplies. The intent of the rule is to provide increased public health protection from exposure to potentially harmful disinfection by-products.

DECIBEL (dB) – The standard unit of noise measurement, which expresses the relative difference in energy between acoustic signals in terms of the common logarithm of the ratio between the signals. Ten units represent a doubling of acoustic energy.

DECIBEL A-WEIGHTED (dBA) – Environmental noise is usually measured in A-weighted decibels (dBA). A dBA is a decibel corrected for the variation in frequency response of the human ear at commonly encountered noise levels.

DECHLORINATION – The process of removing chlorine from water.

DECHLORAMINATION – The process of removing both chlorine and ammonia from water.

DHS – Department of Health Services (State of California).

DIALYSIS – (also termed hemodialysis) A procedure for removing metabolic waste products or toxic substances from the human bloodstream by mechanical means using selective diffusion through a semipermeable membrane.

DISINFECTION / DISINFECTION BY-PRODUCTS – Disinfection is the treatment process used to inactivate and destroy disease-causing bacteria, viruses, and other waterborne microorganisms. Chlorine, a commonly and historically used disinfectant in drinking water, provides a high degree of public health protection from bacteria and viruses. However, in 1974 it was discovered that chlorine reacts with natural organic and inorganic matter in water to form disinfection by-products. The major groups of disinfection by-products produced by chlorination are trihalomethanes and haloacetic acids, and these by-products have been shown to cause health effects in laboratory animals. Thus, based on numerous toxicological studies, the

USEPA adopted the D/DBP Rule to lower the public health risk associated with potential exposure to disinfection by-products.

DTSC – Department of Toxic Substances Control (State of California).

EXOTHERMIC – A chemical reaction in which heat is released.

EBRPD – East Bay Regional Park District.

ECAP – East County Area Plan (Alameda County).

ENVIRONMENTAL IMPACT REPORT (EIR). An assessment of the environmental effects of a proposed action, in accordance with the California Environmental Quality Act (CEQA).

ESA – Environmental Science Associates.

ESU – Evolutionarily Significant Unit.

EUTROPHICATION – The process that occurs when a natural body of water receives high concentrations of dissolved nutrients, which can promote excessive growth of algae and lead to oxygen depletion and poor water quality conditions.

FESA – Federal Endangered Species Act.

FLOODPLAIN – A nearly level alluvial plain that borders a stream and is subject to periodic flooding unless protected artificially.

FILTRATION – A treatment process in which water or wastewater passes through sand or other granular material to remove suspended particles.

FREE CHLORINE – Chlorine in its uncombined form. It is a strong disinfectant that is typically added to water systems in the form of chlorine gas or liquid sodium hypochlorite.

GENERAL PLAN – A long-range comprehensive plan to guide development required by state law for California jurisdictions.

GGNRA – Golden Gate National Recreation Area.

gpm – gallons per minute.

GROUNDWATER – All subsurface water (below soil/ground surface), distinct from surface water.

HAA (HALOACETIC ACID) – A disinfection by-product formed by the combination of chlorine or bromine and natural organic matter.

HAZARDOUS MATERIAL – A substance or combination of substances, that because of quantity, concentration, or physical, chemical, or infectious characteristics, may either: (1) cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or

incapacitating illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

HAZARDOUS WASTE – Hazardous wastes are hazardous materials that no longer have practical use, such as substances that have been discarded, spilled, or contaminated, or that are being stored temporarily prior to proper disposal.

HMBP – Hazardous Materials Business Plan.

HYDROPHYTIC – A plant adapted to grow in water.

I-580 – Interstate 580.

IMPACT – In environmental studies, the word "impact" is used to express a physical effect, that is generally adverse but can also be beneficial. Effects or impacts may be ecological, aesthetic, historic, cultural, economic, and social, or health related, and they may be direct, indirect, or cumulative.

JURISDICTIONAL WETLANDS – In a jurisdictional sense, the State of California and federal agencies have separate operating definitions of a "jurisdictional wetland." The broad CDFG wetland definition characterizes jurisdictional wetlands as areas that have wetland soil characteristics, wetland hydrology, hydrophytic vegetation. To meet the federal Corps definition, an area must exhibit all three components.

KILOWATT-HOURS (kWh) – A unit of electrical energy. One kWh is equivalent to 10,238 Btu, taking into account initial conversion losses (i.e., from one type of energy, e.g. chemical, to another type of energy, e.g. mechanical) and transmission losses.

L_{eq} – Equivalent Energy Sound Level, which is the average acoustic energy content of time-varying noise during the measurement period.

LEVEL OF SERVICE (LOS) VEHICULAR – A qualitative measure that describes vehicular traffic operating conditions (e.g., delay, queue lengths, intersection congestion). Intersection levels of service range from LOS A (i.e., excellent conditions with little or no vehicle delay) to LOS F (i.e., excessive vehicle delays and queue lengths). LOS D is typically identified as the minimum acceptable level of service at urban intersections.

LIQUEFACTION – Liquefaction occurs when generally loose, saturated, cohesionless soils compact under the effects of seismic shaking and lose shear strength, causing them to behave like a liquid.

LOS – Level of Service, used in referring to efficiency of traffic movement on roadways.

LRMS – Land and Resource Management Section of the San Francisco Public Utilities Commission.

MBTA – Migratory Bird Treaty Act.

MCL – Maximum Contaminant Level. The MCL is the highest level of a contaminant that is allowed in drinking water. The MCL is set as close to the MCLG as is economically or technically feasible. While the MCL is higher than the MCLG, it is considered protective of human health.

MCLG – Maximum Contaminant Level Goal. The MCLG is the level below which there is no known or expected health risk to human health.

MEA – Major Environmental Analysis (section of the San Francisco Planning Department)

mg/L – milligrams per liter, equivalent to parts per million.

μg/L – micrograms per liter, equivalent to parts per billion

mgd – million gallons per day.

MITIGATION MEASURE – An action that can be planned or taken to alleviate (mitigate) an adverse environmental impact. Mitigation includes:

(1) Avoiding the impact altogether by not taking a certain action or parts of an action.

(2) Minimizing the impact by limiting the degree or magnitude of the action and its implementation.

(3) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.

(4) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

(5) Compensating for the impact by replacing or providing substitute resources or environments.

mm/yr – millimeters per year.

MMRP – Mitigation Monitoring and Reporting Program.

MOBILE SOURCE – Refers to a category of air pollutant emissions sources. This category includes those sources that routinely move from place to place. Examples include aircraft, automobiles, trucks, trains, ships, and bulldozers.

MOMENT MAGNITUDE – Moment magnitude is related to the physical size of a fault rupture and movement across a fault. Richter magnitude scale reflects the maximum amplitude of a particular type of seismic wave. Moment magnitude provides a physically meaningful measure of the size of a faulting event.

MVMT – millions of vehicle-miles traveled.

NITRIFICATION – To oxidize (an ammonia compound) into nitric acid, nitrous acid, or any nitrate or nitrite, especially by the action of nitrobacteria.

NITROGEN LOADING – The addition of nitrogen-rich compounds, typically in excess.

NITROGEN-LIMITED – An ecosystem in which essential nutrients for plant growth are available in abundance, with the exception of nitrogen.

NMFS – National Marine Fisheries Service.

NOISE-SENSITIVE LAND USE – Land uses that can be adversely affected by high levels of noise. Residences, schools, hospital facilities, libraries and other similar uses are often considered to be sensitive to noise.

NPDES – National Pollutant Discharge Elimination System.

NRHP – National Register of Historic Places.

NRCS – Natural Resource Conservation Service.

PEAK HOUR – A defined period during which the highest traffic activity occurs (or is expected to occur).

OZONATION – A disinfection process that uses ozone, a highly reactive form of oxygen, to inactivate pathogenic microorganisms.

PASSERINE – Of or relating to birds of the order Passeriformes, which includes perching birds and songbirds such as jays, blackbirds, finches, warblers, and sparrows.

PRIMARY DISINFECTION – Primary disinfection provides initial inactivation of microbial pathogens before the water supply enters the distribution system. Water quality regulations require a specified combination of minimum concentration of primary disinfectant and length of contact time.

PROGRAM-LEVEL ANALYSIS – A project or project components that have been studied at a general level and that have not yet been fully studied in detail because site-specific design information is not available.

PROJECT-LEVEL ANALYSIS – A site-specific, detailed analysis.

RAPTOR – A bird of prey.

RESIDUAL DISINFECTION – The concentration of disinfectant that remains in treated water in transmission and distribution systems that limits microbial regrowth or development of biofilms in the transmission and distribution facilities.

RWQCB – Regional Water Quality Control Board (State of California).

SAA – Streambed Alteration Agreement.

SAFE DRINKING WATER ACT – The nation's major law regulating drinking water quality, implemented by the USEPA. The Safe Drinking Water Act established primary and secondary

drinking water regulations, and implementation and enforcement of this act has been delegated to the states. This act promulgates primary drinking water regulations that specify a maximum contaminant level for contaminants that "may have any adverse effect on the health of persons and which is known or anticipated to occur in public water systems."

SCADA – System Controls and Data Acquisition.

SCARP – a steep or nearly vertical soil surface; a scarp can occur along an earthquake fault.

SEICHE – An earthquake-induced wave on an enclosed body of water. This hazard is most prevalent near lakes and reservoirs.

SFDPW – San Francisco Department of Public Works.

SFPUC – San Francisco Public Utilities Commission.

SFWD – San Francisco Water Department.

SHPO – State Historic Preservation Officer.

SIGNIFICANCE CRITERIA – Criteria that establish the thresholds used to determine when and if an environmental impact is significant or less than significant.

SIGNIFICANT IMPACT or SIGNIFICANT EFFECT – A substantial or potentially substantial adverse physical change as evaluated based on the Significance Criteria.

SJVUAPCD – San Joaquin Valley Unified Air Pollution Control District.

SOCIOECONOMIC – Pertaining to the demographic and economic characteristics of a region.

SPECIAL-STATUS SPECIES – "Special-status" species are defined as those with any form of legal protection due to rarity or limited distribution, or any species of local concern whose presence might determine a significant impact under CEQA.

SR – State Route.

STATIONARY SOURCE – Refers to a category of air pollutant emission sources. This category includes those sources that routinely remain in one place. Examples include power plants, boilers, and storage tanks.

SURFACE RUPTURE – Surface rupture occurs when the movement of a fault deep within the earth breaks through to the surface. The rupture almost always follows preexisting faults that are zones of weakness. When the rupture occurs suddenly during an earthquake, structures located along the fault trace can be extensively damaged.

SWPPP – Storm Water Pollution Prevention Plan.

SWRCB – State Water Resources Control Board (State of California).

THM (TRIHALOMETHANES) – A disinfection by-product formed by the combination of chlorine or bromine and natural organic matter.

TSUNAMI – A series of sea waves instantaneously generated by an earthquake. This hazard is most prevalent at shoreline areas.

USC – United States Code.

USEPA – United States Environmental Protection Agency.

USFWS – United States Fish and Wildlife Service.

USGS – United States Geological Survey.

USSG – United States Surveyor General.

VOLUME-TO-CAPACITY RATIO (V/C RATIO) – The sum of the critical (per lane) volumes on conflicting intersection movements divided by the capacity of the intersection. If the sum of conflicting movement volumes is equal to the capacity of the intersection, the v/c ratio is 1.00.

WATERS OF THE UNITED STATES – A broad federal definition that describes Corps jurisdiction over deep-water habitats and special aquatic sites, including wetlands, as follows:

a. The territorial seas with respect to the discharge of fill material.
b. Coastal and inland waters, lakes, rivers, and streams that are navigable waters of the United States, including their adjacent wetlands.
c. Tributaries to navigable waters of the United States, including wetlands.
d. Interstate waters and their tributaries, including adjacent wetlands.
e. All other waters of the United States not identified above, such as isolated wetlands and lakes, intermittent streams, prairie potholes, and other waters that are not a part of a tributary system to interstate waters or navigable waters of the United States, the degradation or destruction of which could affect interstate commerce.

WATERSHED – The region draining into a river, river system, or other body of water

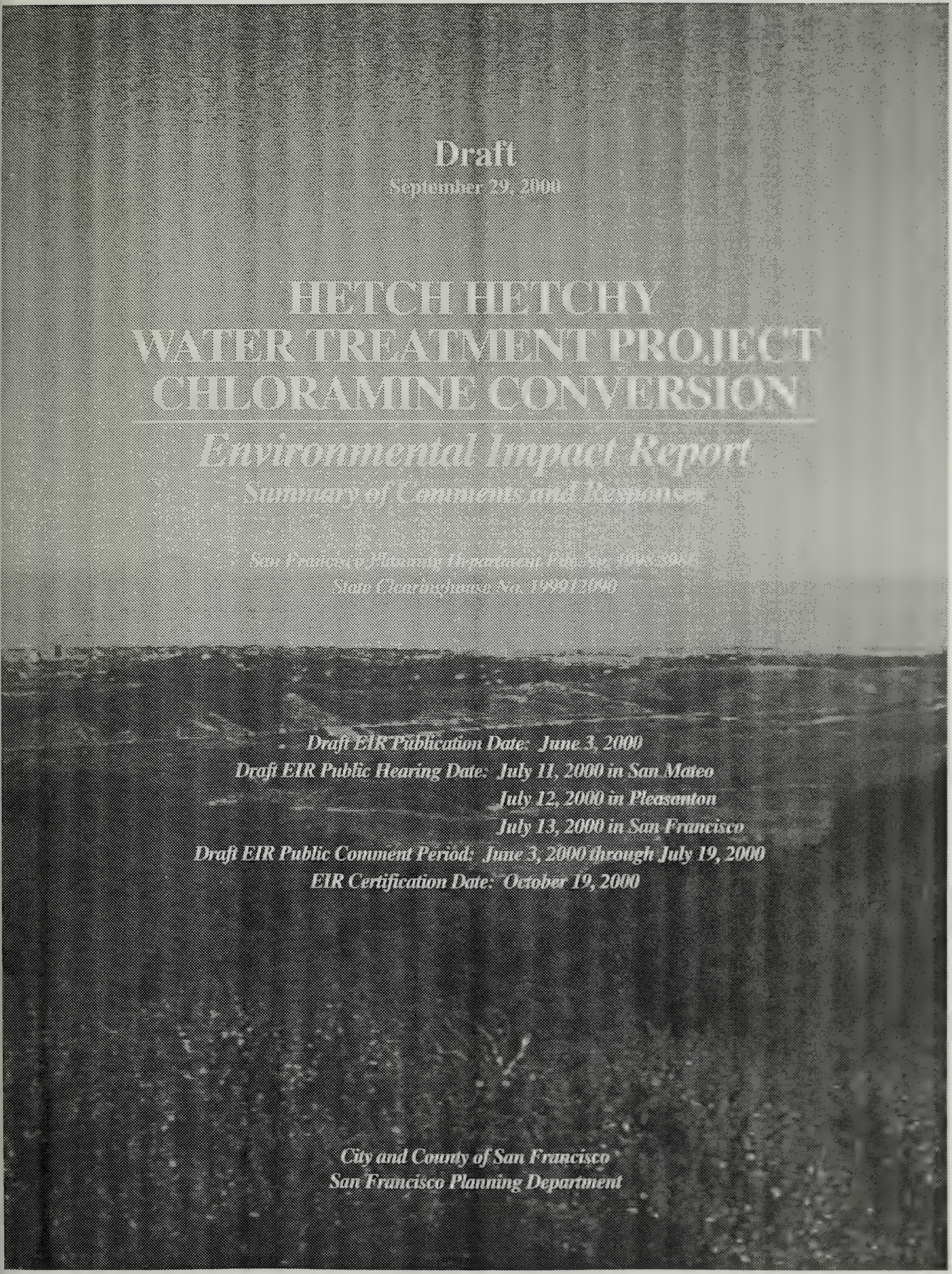
WETLANDS – Wetlands as defined under the Clean Water Act (33 CFR 328.3[b]; 40 CFR 230.3[t]) are "...those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

WHR – Wildlife Habitat Relationships; a database developed by the CDFG.

WTP – Water Treatment Plant.

APPENDIX G

HETCH HETCHY WATER TREATMENT PROJECT--
CHLORAMINE CONVERSION EIR
SUMMARY OF COMMENTS AND RESPONSES



Draft

September 29, 2000

HETCH HETCHY WATER TREATMENT PROJECT CHLORAMINE CONVERSION

Environmental Impact Report

Summary of Comments and Responses

San Francisco Planning Department File No. [illegible]

State Clearinghouse No. [illegible]

Draft EIR Publication Date: June 3, 2000

Draft EIR Public Hearing Date: July 11, 2000 in San Mateo

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Draft EIR Public Comment Period: June 3, 2000 through July 19, 2000

EIR Certification Date: October 19, 2000

City and County of San Francisco

San Francisco Planning Department

Draft
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HETCH HETCHY WATER TREATMENT PROJECT CHLORAMINE CONVERSION

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CHAPTER I

INTRODUCTION

This document contains public comments received on the Draft Environmental Impact Report (Draft EIR, or DEIR) prepared for the San Francisco Public Utilities Commission (SFPUC) Hetch Hetchy Water Treatment Project--Chloramine Conversion, and responses to those comments. The DEIR analyzed the physical environmental effects of the conversion of the residual disinfectant for the water supply from chlorine to chloramine (a combination of chlorine and ammonia) and of the associated facilities.

Following this introduction, Chapter II contains a list of all persons and organizations who submitted written comments on the Draft EIR and who testified at the public hearings on the Draft EIR held on July 11, 2000 in San Mateo, July 12, 2000 in Pleasanton, and July 13, 2000 in San Francisco. Following the list of commentors, Chapter II also presents responses to the comments, organized by comment topic area. Each substantive comment on the EIR is recorded in Chapter II, and the response to each comment is presented immediately after that comment. Duplicative or substantially similar comments are grouped together, with a single response. Some comments do not pertain to physical environmental issues, but responses are included to provide additional information for use by decision-makers.

These comments and responses will be incorporated into the Final EIR as a new chapter. Text changes resulting from comments and responses will also be incorporated in the Final EIR, as indicated in the responses. Where the response calls for revision to the Draft EIR, the text is indented; new text is shown in boldface type and deleted text is shown as strikethrough text.

CHAPTER II

SUMMARY OF COMMENTS AND RESPONSES

The following is a list of all persons and organizations who submitted written comments on the Draft EIR and who testified at the public hearings on the Draft EIR held on July 11, 2000 in San Mateo, July 12, 2000 in Pleasanton, and July 13, 2000 in San Francisco.

Federal Agencies

United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southwest Region, James R. Bybee, Protected Habitat Manager, Northern California, July 17, 2000 (Comments F-1, F-2, G-11, G-12)

United States Department of the Interior, National Park Service, Golden Gate National Recreation Area, Brian O'Neill, General Superintendent, July 19, 2000 (Comments A-3, B-4, B-6, B-11, B-12, D-3, D-4, D-5, E-1, F-3, F-5, F-8, F-9, F-10, F-12, F-13, F-14, F-15, F-16, F-17, F-18, G-2, G-5, G-6, G-7, G-8, G-9, G-10, G-13, G-24, I-1, I-4, J-1, J-2, K-1, K-2, L-1, M-1, N-2, O-1, P-1, P-2, P-3)

State Agencies

California Regional Water Quality Control Board, San Francisco Bay Region, Dale C. Bowyer, Senior Water Resources Engineer, July 18, 2000 (Comments B-2, B-3, B-5, B-7, B-8, B-9, C-1, C-2, C-3, F-6, F-7, G-3, G-4, G-14, G-15, G-16, G-17, G-18, G-19, G-20, G-21, G-22, G-23, G-25, G-26, G-27, G-28)

State of California Business, Transportation and Housing Agency, Department of Transportation, Jean C.R. Finney, District Branch Chief, July 11, 2000 (Comment Q-2)

Local Agencies

Alameda County Water District, Paul Piraino, General Manager, July 17, 2000 (Comments A-1, B-1, B-10, G-1)

City of San Mateo, Department of Community Development, Mary Gallagher, Chief of Planning, July 18, 2000 (Comments A-2, D-1, F-4, F-11, I-2, I-3)

City of Sunnyvale, Mark R. Dettle, Assistant Director of Public Works/City Engineer, July 14, 2000 (Comment Q-1)

County of San Mateo, Planning and Building Division, Jim Eggemeyer, Development Review Manager, July 18, 2000 (Comments D-2, N-1)

Private Individuals and Groups

Walter E. Goldstein, Ph.D., June 17, 2000 (Comments H-2, H-3, H-4)

San Mateo Public Meeting (July 11, 2000)

Walter Goldstein (Comments H-1, H-5)

Pleasanton Public Meeting (July 12, 2000)

There were no comments made at the public meeting held in Pleasanton.

San Francisco Public Meeting (July 13, 2000)

There were no comments made at the public meeting held in San Francisco.

A. BACKGROUND

Comment A-1: "ACWD first converted the Mission San Jose Water Treatment Plant to the use of chloramines to help minimize the formation of disinfection byproducts in the early 1980's. By mid-1998, all primary production sources were converted to the use of chloramines and all customers have received chloraminated water since that time. The last production facility to be converted, the 45-million gallons per day Blending Facility (which combines groundwater and SFPUC water) was designed in anticipation of the SFPUC's conversion project. We concur that the project constitutes an important step to improve upon the current disinfection practice and will achieve a greater measure of drinking water health protection for the 2.4 million customers that the SFPUC's water supply system ultimately serves." (Alameda County Water District)

Response: The information provided by the Alameda County Water District is noted. The SFPUC would utilize such information in their planning and public outreach efforts for the conversion to chloramine disinfection.

Comment A-2: "Program Level/Project EIR- The introduction in the EIR states that additional environmental review would be required to analyze those portions of the project where site-specific information is not available. Components of the project where additional review will be necessary should be clearly identified and potential impacts disclosed. If the full environmental impacts of the project are not yet known (due to lack of site-specific details) how can the determination be made that the project, as proposed, would not result in any significant environmental impacts? Questions regarding biological and aesthetic impacts on the Pulgas site require additional information and therefore it is imprudent to conclude that these impacts have been mitigated to a less-than-significant level with the mitigation identified." (City of San Mateo)

Response: The Draft EIR describes the difference between "project-level" and "program-level" analysis (see DEIR page II-3). A *project* level analysis was conducted on those project components where there is adequate site-specific information to determine the potential environmental effects associated with construction and operation of the project. This included all the major project components of the chloramine conversion project, as described on DEIR pages III-7 through III-35. The Draft EIR provides full disclosure of the potential impacts associated with these project components and recommends mitigation measures to reduce impacts to a less than significant level.

A *program* level analysis was conducted for those components with insufficient site and/or design information available; only the proposed dechlorination facilities at the secondary discharge locations and the modifications to the San Francisco City Distribution Division system and the Bay Area Water Users Association (BAWUA) member agencies' systems were analyzed at a program level, as described on DEIR pages III-35 through III-41. The Draft EIR provides a generic approach to environmental analysis of these components, all of which are at locations remote from the major project locations. On a program level, the Draft EIR determined that all potential impacts of these components can be mitigated to a less than significant level.

Planning, design, and construction of the major project components can proceed independently of the program-level components without significant environmental effects. If determined necessary by the San Francisco Planning Department or other applicable jurisdictions (for BAWUA agencies' systems), any subsequent environmental review for the components evaluated at a program level can be conducted independently of the major project components to eliminate or minimize any potential environmental effects at these other locations.

The Draft EIR analyzes potential environmental effects at the Pulgas site at a *project* level of detail, including biological and aesthetic impacts. The analysis is based on available conceptual design information, or where design information is unavailable, on maximum impact scenarios such as maximum envelope of disruption. Subsequent information to be developed during the design phase would fall within the parameters or restrictions provided under conceptual design or worst-case scenario. Therefore, there is sufficient information to conduct the project-level analysis of the Pulgas site in the Draft EIR. Although potentially significant biological and aesthetic impacts were identified at the Pulgas site, the Draft EIR presents mitigation measures that could reduce these impacts to less than significant.

Comment A-3: "Ensure that GGNRA and Presidio Trust are included in the formal outreach program." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: As described on DEIR pages II-5 through II-6, the SFPUC will conduct a formal outreach program that includes all of its water customers. As one of the water customers, the Golden Gate National Recreation Area (GGNRA) and the Presidio Trust will be included in the outreach program. The formal public outreach program is scheduled to begin one year prior to actual conversion.

B. PROJECT DESCRIPTION

1.0 CHEMICAL DESIGN COMMENTS

Comment B-1: "2. The SFPUC should make chemical dosage and disinfectant residual data available in real-time to retail agencies that need such information. It is particularly important to provide advanced notification of significant changes in dosages so that operational adjustments are properly made by those agencies blending water and/or providing supplemental disinfection." (Alameda County Water District)

Response: The SFPUC is in the process of implementing a new System Controls and Data Acquisition (SCADA) system for monitoring and operation of all SFPUC facilities. This SCADA system will expand on the existing SCADA capabilities currently available at the SFPUC water treatment plants. The new SCADA project does not include the addition of treatment plant chemical dose data; this data is managed by the SCADA systems already in place at the water treatment plants.

The SCADA project will add new monitoring points and/or monitoring parameters upstream of the Alameda County Water District (ACWD) turnout. Monitoring locations include Tesla Portal, Alameda East Portal, Alameda West Portal, Irvington Portal, and the ACWD turnout in Fremont. Parameters that may be monitored at some of these locations include chlorine residual (total chlorine will be measured after the conversion to chloramine), pH, turbidity, and temperature.

The SFPUC will have "near-time" data available to all BAWUA customers (ACWD is a BAWUA member agency). Real-time data, including but not limited to disinfectant residual, can be provided to individual customers on a case-by-case basis, as agreed upon by both the SFPUC and the customer. However, routine provision of real-time chemical dose information is not planned for BAWUA customers. The SFPUC and the City of Milpitas are currently drafting an Memorandum of Understanding (MOU) regarding the sharing of real-time information. This MOU can serve as a model for developing similar agreements between the SFPUC and other BAWUA customers on a case-specific basis.

Comment B-2: "This would be accomplished by adding ammonia and additional chlorine (as needed) to chlorinated water in the PUCs pipelines so as to maintain a chloramine to ammonia ratio of about 5:1 (it is unclear whether this is a molar or weight ratio)." (California Regional Water Quality Control Board)

Response: Under the chloramine conversion project, the SFPUC is proposing to maintain a chlorine to ammonia ratio of about five to one on a mass basis, as described on DEIR page III-4.

Comment B-3: "At points where PUC water is discharged, all chlorine would be removed prior to any discharge. Ammonia concentrations would be reduced prior to discharge at some, but not all locations. At points where ammonia was to be removed, the water would first be acidified, then superchlorinated to remove ammonia in the form of nitrogen gas. In all cases, chlorine

would be removed by adding a dechlorinating agent such as sodium bisulfite." (California Regional Water Quality Control Board)

Response: The commentor is correct in summarizing the proposed chemical processes, which are described on Draft EIR pages III-3 through III-7.

Comment B-4: "The project description does not state the preferred method of dechloramination, contractor basin or piping, including information on the environmentally preferable alternative. The selection criteria and advantages and disadvantages of each alternative should be outlined in the table." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: The commentor is correct in stating that it has not yet been determined whether to construct a contactor basin or contactor pipeline at the proposed Pulgas dechloramination facility, as described on Draft EIR page III-25. At this preliminary design stage, the detailed engineering advantages and disadvantages of the two methods have not yet been identified, and the information for the requested table has not been developed. However, there is sufficient information in the conceptual design report about either system for environmental review purposes. Thus, the EIR analyzes the potential environmental effects of both systems, which would be similar, as either system would require a similar area of disturbance. The determination of the dechloramination method would be made during the design stage following EIR certification and project approval.

2.0 CONSTRUCTION IMPACTS

Comment B-5: "Construction: To carry out the conversion, the SFPUC would construct chloramination and dechloramination facilities, chemical storage facilities, pipelines, and access roads. This construction would require disturbing a total of 12.3-13.3 acres of land belonging to the City and County (C and C) of San Francisco. The construction and use of these facilities might impact jurisdictional wetlands and/or state and federally protected species." (California Regional Water Quality Control Board)

Response: The commentor is correct in summarizing the proposed construction scenario of the project, which is described in more detail on Draft EIR pages III-41 through III-44. The DEIR describes the potential impacts to jurisdictional wetlands and/or state and federally protected species associated with this construction scenario on DEIR pages IV.C-22 through IV.C-33. Potential impacts identified in that section would be reduced to less than significant with mitigation measures described in DEIR Section V (see pages V-2 through V-10).

Comment B-6: "Table III-2, Note g. Borrow and disposal sites are not described or discussed in the document. An analysis of the impacts of stockpiling or spreading 32,000 cubic yards of material over 'undeveloped field or level areas in the project vicinity' should be included in the EIR." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: Borrow and disposal sites have not been identified as part of the conceptual design process. The volumes of excavated material presented in Table III-2 of the Draft EIR (page III-42) are conservatively high estimates used for impact analysis purposes. The estimates would be refined during the design phase. However, the overall construction approach would be to balance the volume of excavated material with the volume of fill material needed during construction. Excess excavated material would be used to develop berms as part of the landscaping or spread over the undeveloped field adjacent to the south end of the proposed dechloramination site. This field is regularly disked and plowed as part of the SFPUC watershed maintenance practices, and no sensitive habitat or wetlands would be affected by use of the field for spread of excavated material. Construction of berms or spread of excess excavated material would require implementation of erosion control best management practices, as is required for construction of project facilities. See the response to Comments G-14 through G-16 in Section II.G of this document, which describes typical erosion control practices, such as stabilizing denuded areas and use of sediment barriers. The amount of soil hauled off site would be minimized, and at this time disposal sites have not been identified; selection of disposal sites is typically within the purview of the contractor.

3.0 FACILITY DESIGN DETAILS

Comment B-7: "The DEIR appears, for the most part, to include adequate design elements and control measures to prevent significant negative impacts to water quality and beneficial uses. Regional Water Quality Control Board (Board) staff have some concerns, however, about the mitigation measures to prevent releases of chloramines, chlorine, and the toxic form of ammonia. These measures are not described in sufficient detail to ensure that significant amounts of the above pollutants would not be discharged to surface waters. To address these concerns, The San Francisco Public Utilities District (SFPUC) should describe in greater detail:

- specific measures for preventing system failures,
- the methods used for reducing free residual chlorine concentration in discharges to well below 0.1 part per million (ppm), and
- the methods used to calculate the levels of toxic ammonia that would be discharged." (California Regional Water Quality Control Board)

Comment B-8: "Although the mitigation measures proposed above are thorough and laudable, they are not described in this DEIR in sufficient detail to guarantee that significant negative water quality impacts would be avoided. A discharge of chlorinated, chloraminated, and in particular, superchlorinated water could result in catastrophic impacts to the water quality and wildlife habitat beneficial uses of any receiving waters it might reach. In addition, such a discharge would constitute an exceedance of the SFPUC's discharge limitations, and could result in civil liability. In order to guarantee that the possibility of such a discharge is not significant, the DEIR should describe the specifics of the following mitigation measures:

- the project's 'uninterruptible power supply'
- The 'redundant design elements' to be incorporated into the project

- The dechlorination procedure(s) to be used at all possible points of discharge. Specifically, how will the SFPUC
  - ensure that all water is reduced to well below the 0.1 ppm free residual chlorine concentration that is known to be toxic to fish,
  - ensure the proper addition and mixing of dechlorinating compounds, and
  - ensure that all staff responsible for dechlorinating and monitoring discharged water would be adequately trained?" (California Regional Water Quality Control Board)

Comment B-9: "The DEIR should describe the specific project design measures that will reduce the possibility of a system failure and ensure proper dechlorination of discharge water" (California Regional Water Quality Control Board)

Response: The Draft EIR describes potential impacts to water quality associated with any inadvertent operational discharges of chlorinated, chloraminated, and superchlorinated water to surface waters (see pages IV.D-15 through IV.D-21). Provisions to prevent chlorinated water from entering surface waters include construction of permanent dechlorination facilities at potential discharge sites. Ammonia levels would be reduced at the Pulgas site to prevent excess ammonia from entering Crystal Springs Reservoir, and system back-ups and redundancy would be included to prevent superchlorinated discharges. Although specific facilities operations details would not be developed until the design phase, standard industry and state-of-the-art practices would be incorporated into the project design. Conceptual design indicates that the proposed facilities would include features that prevent discharge of chlorinated, chloraminated, and superchlorinated water to surface waters.

Although not specified explicitly in the Draft EIR, all of the chemical feed facilities would be equipped with appropriate analyzers and related instrumentation to monitor water quality parameters of concern, downstream of chemical injection points. Where appropriate, the system could measure in-line concentrations of chlorine, pH, and temperature, and instruments would be calibrated to meet applicable discharge standards. Signals and alarms from these analyzers and instruments are typically routed through a critical component of the chemical facilities' on-site computerized control systems, known as Programmable Logic Controller (PLC) systems. These analyzers and related instruments would provide process signals to the PLC system, which in turn, would translate those signals through a computer program, and deliver the corresponding control signal to the chemical feed system to adjust (i.e., increase or decrease) the chemical output as necessary. This is typically referred to as a closed-loop control scheme and is the most common method of controlling chemical feed systems and maintaining constant downstream water quality parameters. In summary, the standard control strategies used for disinfecting drinking water and for chemically removing chlorinous compounds in discharges are planned for these facilities.

The monitoring and control system would also be connected to the System Controls and Data Acquisition (SCADA) system, which would monitor the entire SFPUC water transmission and distribution system. Monitoring data would be transmitted to the nearest water treatment plant where there are operators 24 hours a day who could, if necessary, manually override or respond to alarms via the on-site PLC systems. The SCADA system would also include programmed target

set-point ranges for critical water quality parameters. Deviations from the "target range" would trigger computer and audible alarms to notify operations staff charged with responding to the alarms and taking the appropriate action.

The chemical feed and control systems for the proposed facilities would also include an appropriate level of redundancy to ensure continuous facility operation. This redundancy could include, but would not be limited to, back-up/standby chemical metering pumps, back-up water quality analyzers and instruments, back-up power supply (emergency generators for general power needs, and additional battery packs such as uninterruptible power supply, or UPS, system for analyzers/instruments). The control system would be designed such that failure of a critical component (such as a metering pump or residual analyzer) automatically triggers the start-up of the standby components (via SCADA). Although such automatic features would be incorporated into the control system, any equipment failure or deviation from established water quality targets would trigger computer and audible alarms that must be acknowledged by operations staff.

SFPUC staff would be properly trained to operate during routine and emergency periods for each facility. Each treatment facility would also have an "Operations Plan." Similar to the Operations Plans for existing water treatment plants, the plans for new facilities would describe the treatment system equipment components and layout, redundancy components, mode of operation, sampling/monitoring system, alarm system, operator duties, and alarm/emergency response and response protocols (including contact lists).

Comment B-10: "1. As a downstream user of water from Alameda Creek, ACWD should be contacted promptly by the SFPUC at the onset of any potentially significant overflow or chemical spill event from project facilities in the Sunol Valley (Alameda East, San Antonio Pump Station, and Alameda West). The SFPUC should commit to exchanging emergency contact lists with ACWD on a routine basis to ensure that names and phone numbers for emergency response personnel are kept current." (Alameda County Water District)

The SFPUC will develop notification procedures, in conjunction with ACWD, prior to implementation of the proposed project. As described on Draft EIR page IV.I-13, the proposed project includes secondary containment design provisions for both chemical storage facilities and chemical feed pipelines, in accordance with applicable regulations. If a chemical spill were to occur in secondary containment areas, the spillage would be pumped and disposed of, in accordance with applicable regulations. These design provisions would minimize any risk associated with the release of chemicals from project facilities. However, in the unlikely event of a chemical spill, the SFPUC would implement emergency response procedures that are part of the Hazardous Materials Business Plan required for each facility. The Hazardous Materials Business Plan specifies procedures for responding to a chemical spill and reporting the spill to the appropriate regulatory agencies. If a spill to drinking water were to occur, the SFPUC would be responsible for coordinating response actions and notifying the SFPUC Water Quality Division. The Water Quality Division would then notify the Department of Health Services. If there were a spill affecting water quality in Alameda Creek, the SFPUC would be responsible for notifying the Alameda County Department of Environmental Health, California Office of Emergency Services, Regional Water Quality Control Board, U.S. Environmental Protection Agency, California

Department of Fish and Game, U.S. Coast Guard, and Department of Toxic Substances Control, as appropriate.

Comment B-11: "The project description could provide greater detail of the proposed facility, including depth below grade for the 65,000 square foot contactor basin or the 10 to 12 foot diameter pipes." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: The Draft EIR presents conceptual design information for the proposed facilities at a level of detail sufficient to conduct the environmental analysis of potential impacts. Details of the facilities would not be developed until the design phase, although as stated in the Draft EIR, it is estimated that excavation for the contactor pipeline could be 15 to 25 feet deep (see page III-43).

Comment B-12: "Table III-1: New Impervious Surfaces areas (30,000 sf and 3,200 sf) at Locations 3a and 4 are inconsistent with the numbers provided in the New Structures and New Roadways column. For site 3b., the 500 ft. 6" pipeline from the reservoir to the pump station should be included under Pipelines." (Brian O'Neill, United States Department of the Interior)

Response: The commentor is correct regarding errors in calculations of impervious surfaces shown on Table III-1. In response to this comment, DEIR page III-8, Table III-1, column "New Impervious Surfaces," line "3a. Pulgas Site, San Mateo County" has been revised:

> 20,000 + 4,000 **+**
> **5,000** + 6,000 =
> ~~30,000~~**35,000** square feet

Also in response to this comment, DEIR page III-9, Table III-1, column "New Impervious Surfaces," line "4. Harry W. Tracy WTP, San Mateo County" has been revised:

> 1,500 + 1,600 + ~~100~~
> **120** = ~~3,200~~
> **3,220** square feet

For Site 3b, Table III-1 does include 500 linear feet of 6-inch-diameter pipeline under the column "Pipelines," as requested by the commentor. No change to the DEIR is warranted.

C. PROJECT APPROVALS

Comment C-1: "As mentioned in the DEIR, because the entire project would disturb more than five acres of land during construction, it must be covered under the State NPDES General Permit for Discharges of Storm Water Associated with Construction Activity (General Permit). Although the individual sites may be less than 5 acres in size, they must still be covered under the General Permit. This permit can be obtained by filing a Notice of Intent with the State Water Resources Control Board, Division of Water Quality. The lead agency can obtain an NOI and the General Permit from the State Water Resources Control Board web page at www.swrcb.ca.gov. The project sponsor must propose and implement control measures that are consistent with the General Permit and with the recommendations and policies of the local agency and the Regional Board." (California Regional Water Quality Control Board)

Comment C-2: "The lead agency is required to obtain an NPDES General Permit covering all sites on which construction would occur." (California Regional Water Quality Control Board)

Response: The NPDES General Permit for storm water discharges associated with construction activity states that this permit applies to construction activity that results in soil disturbances of at least five acres of total land area. The intent of the NPDES regulation is to protect water quality from storm water generated at large (greater than five acres), contiguous construction sites. Although the proposed project involves multiple facility locations, construction of the individual facilities at each location is considered to be a separate construction area. As described in the Draft EIR, the project locations at Tesla, Sunol Valley, Pulgas area, and Harry W. Tracy WTP are situated in disparate geographic locations in different watersheds and counties. As shown in DEIR Table III-2, only the facilities at the Pulgas site would require a construction area greater than five acres (see page III-42); construction of the Pulgas dechloramination facility would require 9 to 10 acres of disturbance. The Tesla, Sunol Valley, and Harry W. Tracy WTP project locations would each be well under five acres in size. Although an NPDES permit is not required for these sites, the SFPUC would implement erosion control and other Best Management Practices to protect water quality, as described in the Draft EIR (see page IV.D-14). Construction of the various facilities would be subject to different contract specifications, as required for each site, and each contract would have site-specific storm water control provisions that comply with any applicable discharge requirements, with the General Permit provisions applicable only to the Pulgas site.

Comment C-3: "The lead agency is required to obtain 401 certification from the San Francisco and/or Central Valley Regional Boards for any alteration or fill of wetlands." (California Regional Water Quality Control Board)

Response: The comment regarding 401 certification requirements is noted. The SFPUC would comply with these regulations as applicable under the proposed project, as discussed in the Draft EIR (see page III-48).

D. PLANS AND POLICIES

Comment D-1: "Plans and Policies- The EIR includes a list of County of San Mateo policies applicable to the project. The EIR correctly states that non-conformance with these policies does not always constitute an environmental impact. However, the document does not discuss the project's conformance with these policies and is therefore deficient. Policies regarding habitat protection, vegetation removal, protection of scenic resources, etc. should be discussed in the context of the proposed project. A section of the project's general conformance with these plans and policies needs to be included in the document." (City of San Mateo)

Comment D-2: "2. Please note that Government Code Section 65402 requires the lead agency to obtain a General Plan conformity determination for the proposed project." (County of San Mateo)

Response: As described in the Draft EIR, the proposed project, located on lands owned by the City and County of San Francisco, is not subject to the planning and building laws of any other city or county in which those lands are located (see pages IV.A-1 through IV.A-10). The general plans and polices of San Joaquin County, Alameda County, and San Mateo County do not apply to this project. The referenced excerpts from the general plans of San Joaquin County, Alameda County, and San Mateo County and various regional plans are presented in the EIR for informational purposes only. Furthermore, determinations of general plan conformity are within the purview of decision-makers in those jurisdictions. With mitigation measures identified in DEIR Chapter V, no substantial conflict with various general plans and other environmental policies is foreseen. Following completion of this EIR, the SFPUC will submit a description of the project to decision-makers for their advisory determinations of general plan conformity. Therefore, it is not appropriate for the EIR to discuss conformity or to make conformity determinations of the proposed project with these plans. The following text changes to Draft EIR, Section IV.A, Plans and Policies, has been made to clarify this distinction.

DEIR page IV.A-2, paragraph 5:

> ### San Joaquin County General Plan 2010
>
> The *San Joaquin County General Plan 2010* was adopted in July 1992. It establishes land uses, plans, and policies for all unincorporated areas in the County. The plans and policies of the general plan ~~that could be applicable to the proposed project~~ are summarized below and are presented for informational purposes only.

DEIR page IV.A-4, paragraph 2:

> ### East County Area Plan
>
> Alameda County divides its general plan into geographic units; the San Antonio Pump Station site is included in the *East County Area Plan* (ECAP). The ECAP, adopted in May 1994, includes the cities of Dublin, Pleasanton, Livermore, and small portions of

Hayward. Plans and policies of the ECAP ~~that could apply to the proposed project~~ are summarized below and are presented for informational purposes only.

DEIR page IV.A-6, paragraph 3:

San Mateo County General Plan

The *San Mateo County General Plan* was adopted in November 1986. Plans and policies of the general plan ~~that could apply to the proposed project~~ are summarized below and are presented for informational purposes only.

DEIR page IV.A-9, paragraph 3:

San Mateo County General Plan

The plans and policies of the *San Mateo County General Plan* ~~that could be applicable to the Harry W. Tracy WTP site~~ are summarized below and are provided for informational purposes only.

Comment D-3: "Thank you for the opportunity to comment on the Environmental Impact Report (EIR) for the Hetch Hetchy Water Treatment Project Chloramine Conversion Project. In general, the EIR is well written and informative. In reviewing the EIR, the GGNRA focused on the San Francisco Watershed (SF Watershed) elements of the project, in particular the proposed work at the Pulgas site. The GGNRA has an interest in the SF Watershed because of the two easements it administers at the site. The easements articulate an intent that the land will be preserved in its natural condition to the maximum extent possible consistent with the water-related operations and activities of the City. The comments are not intended to question the need for the project, rather comments are provided in an effort to minimize potential impacts of SF Watershed lands and protect the interest of the GGNRA easements. National Park Service National Environmental Policy Act Guideline (NPS-12) states that comments should 'adequately describe practicable alternatives which are less damaging to NPS interests and concerns, and see that these are evaluated realistically and adopted where feasible.' " (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: In compliance with CEQA, this EIR describes a reasonable range of alternatives that would feasibly attain most of the basic objectives of the proposed project but would avoid or substantially lessen any of the significant environmental effects of the project. The alternatives are presented in Chapter VII of the Draft EIR. Although the proposed project is not subject to the National Environmental Policy Act guidelines, the information contained in the EIR provides the information requested by the commentor.

Comment D-4: "**Plans and Policies.** Page IV.A-8 states 'the Park Service can object to development unrelated to utility management or other uses not permitted by the terms of the easements.' This statement is incorrect and should be removed from the FEIR. The National Park Service, as any other reviewer, can comment or object on proposed developments on land within the easements. The Joint Communications Procedures Between the San Francisco Public

Utilities Commission and the Golden Gate National Recreation Area for Routine Work and Special Projects within the San Francisco Peninsula Watershed (March 1997, copy attached); Section B describes the communication on proposed projects within the easements apart from routine maintenance work. It states 'GGNRA will review such projects and may comment in writing within 30 days of receipt. GGNRA may request a consultation, meeting or further information regarding the proposed project at any time within the 30 day comment period.' " (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Comment D-5: "Page IV.A-9 states that 'Therefore, no concurrence on the part of the federal government is required.' The EIR (Page III-45) lists, under required permits and approvals, the U.S. Army Corps of Engineers and the U.S. Fish and Wildlife, two federal government agencies. The sentence should be stricken from this page and from page IV.B-7." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: The attachment submitted by the commentor consisting of the *Joint Communications Procedures between the San Francisco Public Utilities Commission and the Golden Gate Recreation Area for Routine Work and Special Projects Within the San Francisco Peninsula Watershed* is acknowledged. The SFPUC would comply with all requirements of these communications procedures, as applicable to the proposed project. These requirements are summarized on Draft EIR pages IV.A-8 and IV.A-9. In order to avoid misinterpretation of the agreement, the following text changes have been made to DEIR pages IV.A-8 (paragraph 4) and IV.A-9 (paragraph 1) for clarification:

> In 1980, Congress transferred responsibility for administration of the easements to the National Park Service–Golden Gate National Recreation Area. The legislation provides that the terms of the easements are to be administered by the National Park Service. The Peninsula Watershed is not part of a national park or recreation area per se, as the SFPUC retains ownership of the land and the National Park Service has only a limited interest~~; the Park Service can object to development unrelated to utility management or other uses not permitted by the terms of the easements~~. The City is not bound by National Park Service planning mandates or procedures that Golden Gate National Recreation Area must follow. Certain activities unrelated to water supply and utility operations may require "concurrence" of the U.S. Department of the Interior. However, the proposed Pulgas Dechloramination Facility would be a water utility structure, and its construction is an exercise of the City's reserved rights under the terms of both easements. Therefore, no concurrence on the part of the ~~federal government~~**GGNRA** is required.

E. LAND USE

Comment E-1: "Page V-19, N-2: Excess disturbance to natural resources from construction roads and staging areas should be given consideration in evaluating temporary impact to recreational users." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: While the mitigation measure noted in the comment above (Mitgation Measure N-2) addresses construction disruption to recreational users, construction and operation of the proposed project at the Pulgas site, as described on Draft EIR pages III-25 through III-30, are designed to minimize disturbance to wildlife habitats and other natural resources. Construction access roads and staging areas would be located on previously disturbed areas to the extent possible to minimize impacts to natural resources. The natural resources effects of the proposed project are discussed on DEIR pages IV.C-22 through IV.C-33, and mitigation measures that would reduce natural resources impacts to less than significant are listed on DEIR pages V-2 through V-10.

F. BIOLOGICAL RESOURCES

1.0 SPECIAL-STATUS SPECIES

Comment F-1: "This concerns the Hetch Hetchy Water Treatment Project Chloramine Conversion Environmental Impact Report. The proposed project could potentially affect the Central Valley and Central California steelhead evolutionary significant units (ESU) which are listed as threatened under the Endangered Species Act in 63 FR 13347 and 62 FR 43937, respectively. Also potentially affected are three ESUs of chinook salmon; the Sacramento River Winter-Run chinook (listed as endangered by 59 FR 440), the Central Valley Spring-Run chinook (listed as threatened by 64 FR 50394) and the Central Valley Fall/Late Fall-Run (a candidate for listing under 64 FR 50394). These species are known to reside in or use the San Francisco Bay as a migration corridor. Critical habitat for the steelhead and Central Valley Spring-Run chinook salmon ESUs was designated in 65 FR 7764. Critical habitat for the Sacramento River Winter-Run chinook salmon was designated in 58 FR 33212." (United States Department of Commerce)

Comment F-2: "Because of significant impacts to steelhead and chinook and their habitat, the NMFS is concerned that adequate corrective measures be implemented to ensure that the aquatic resources of the San Francisco Bay are protected. We request the San Francisco Planning Department work with NMFS and the Regional Board to address the issues raised in this letter." (United States Department of Commerce)

Response: The above comments address fisheries impacts associated with the attainment of water quality standards for metals, specifically copper, tin, and lead, in discharges. Please see the response provided for Comments G-11 and G-12. As detailed in that response, this project would be in compliance with copper levels regulated under the Lead and Copper Rule, the City's current NPDES permits for discharges of treated wastewater to the San Francisco Bay, and the RWQCB's Total Maximum Daily Load plan, and thus the project would result in less than significant impacts to water quality and the Bay. Therefore, the proposed project would result in less than significant impacts to steelhead and chinook salmon and their habitat.

Comment F-3: "Page IV.C-20, paragraph 3. Suggest showing the snake and frog habitat on a map. Clarify the location of the 'overflow channel work area.' The sentences beginning with 'Grasslands adjacent...' and 'While observed near the site...' seem contradictory, please explain." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: The comment concerns the quality of grasslands habitat at the Pulgas site for supporting California red-legged frog. The seasonally moist willow-riparian habitats identified near the Pulgas site provide upland habitat and potential breeding habitat for both California red-legged frog and San Francisco garter snake. Ephemeral water is available at both willow habitat areas. California red-legged frogs are known to migrate through habitats near breeding pools in search of summer habitat, and may aestivate within grasslands if suitable cover is available. The grasslands at the Pulgas site, as described in DEIR Section IV.C, Biological Resources, refer

specifically to that portion of the project footprint that is covered by grasslands, and apply to the proposed location of the dechloramination facility. While some grasslands in the project vicinity provide excellent habitat for both San Francisco garter snake and California red-legged frog, a thorough survey of the project site did not identify habitat components required by California red-legged frog in the subject grassland. The grasslands in question were generally devoid of burrows, cover (such as woody debris), and topographic features that would provide aestivation or concealment for California red-legged frog. It cannot be ruled out that frogs could seasonally migrate across the site, and it should be clarified that the California red-legged frog is not expected to use the annual grassland portion of the Pulgas site as upland aestivation habitat because of the generally poor cover this area provides.

In response to this comment, DEIR page IV.C-8, Figure IV.C-1 has been revised, as shown on the following page.

Comment F-4: "Special Status Species- The EIR states that San Francisco garter snake and California red legged frog are likely present on the project site and could be impacted during construction of the project. Measure C-6d. states that construction fencing to keep frogs and snakes from the construction area <u>may</u> be used if 'practicable'. No other alternate measures are identified if it is determined that this is not 'practicable'.

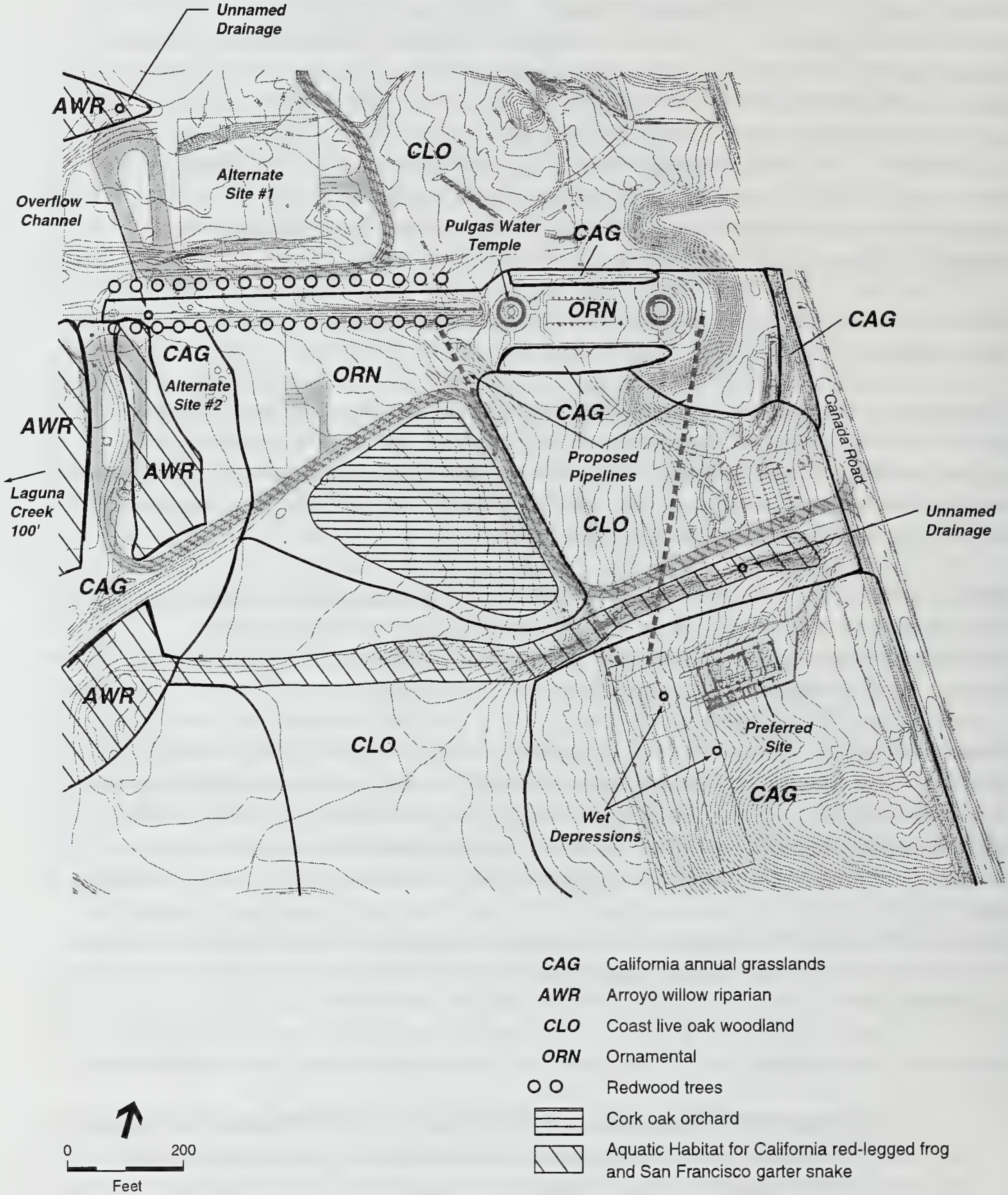
Additional measures for construction impacts must be identified and included in the EIR to make a finding that the project would result in less-than-significant impacts to these species. Identification of these measures is critical given the likelihood of impacts to the garter snake, as illustrated by the BART extension construction." (City of San Mateo)

Response: Comment F-4 is noted, and Mitigation Measure C-6d will be revised, as noted below. In addition, other means of excluding these species could be implemented in coordination with the U.S. Fish and Wildlife Service (USFWS). Such a situation could arise, for example, where the terrain changes abruptly, such as in a creek bed. In a case such as this, other means of excluding these species from the construction zone would be implemented. This may include the use of 4-foot-tall silt fences buried to a depth of 6 inches. While not as sturdy or permanent, this solution could temporarily function as well as plywood sheets. Any selected exclusion method(s) (including the use of plywood sheets) would be approved by the USFWS prior to their implementation.

In response to this comment, text on DEIR page V-6, Mitigation Measure C-6d has been revised:

d. ~~If practicable, t~~The work area shall be fenced with **USFWS-approved** frog- and snake-proof **barriers, such as** mesh fencin**g**~~e,~~ or 4- x 8-foot plywood panels joined lengthwise.

As stated in Mitigation Measure C-4, formal consultation with the USFWS may be initiated to address threatened and endangered species issues. Informal USFWS consultation occurred during EIR preparation and assisted in the analysis of project impacts conducted for the natural resources section (DEIR Section IV.C). The mitigation measures included in the DEIR are



SOURCE: Environmental Science Associates, 1999, Revised 2000.

1998.898E: Hetch Hetchy Water Treatment Chloramine Conversion Project EIR / 990095

Figure IV.C-1 (Revised)
Pulgas Dechloramination Facility Vegetation Communities and Prominent Natural Features

considered sufficient to address potentially significant biological impacts to threatened and endangered species, and could be expanded upon if the USFWS were to request formal consultation.

The commentor's concerns regarding recent BART extension construction problems[1] may not be fully applicable to the proposed project. The issue in question is the ability of snakes to pass under or through plywood fences and into construction work areas. In the case of the multi-year BART extension project, small mammal activities located near exclusion fences may have breached fence integrity and allowed snakes into construction zones. This problem is not expected for the proposed project because construction would be completed within a shorter, 14 month, time frame (see DEIR Table III-2). As stated above, additional mitigation measures would be carried out at the discretion of the USFWS, if required.

2.0 WETLANDS

Comment F-5: "Page V-3, Wetlands Impacts C-1d. Identify the location of habitat replacement. Clarify if the SF Watershed will provide habitat replacement for Tesla, San Antonio, or Alameda East, including the possibility of creating wetlands." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: The project design would avoid disruption of jurisdictional wetlands if possible. A formal delineation of wetlands has not been conducted to confirm if there would be any loss of wetlands. However, if replacement wetlands are necessary, the SFPUC would try to identify a location within the same watershed where the loss occurs. No specific sites have been identified at this time.

Comment F-6: "Board staff approve of the PUCs intentions to delineate wetland areas and avoid these wherever possible, reduce impacts where total avoidance is not possible, and mitigate impacts only as a last alternative. The disturbance or fill of any wetlands will require water quality certification by the Board, pursuant to section 401 of the Clean Water Act. Additional comments on wetlands are included in the Board's general comments (attached)." (California Regional Water Quality Control Board)

Comment F-7: "Wetlands. Wetlands enhance water quality through such natural functions as flood and erosion control, stream bank stabilization, and filtration and purification of contaminants. Wetlands also provide critical habitats for hundreds of species of fish, birds, and other wildlife, offer open space, and provide many recreational opportunities. Water quality impacts occur in wetlands from construction of structures in waterways, dredging, filling, and altering drainage to wetlands.

The Regional Board must certify that any permit issued by the U.S. Army Corps of Engineers pursuant to Section 404 of the Clean Water Act (covering, dredging, or filling of Waters of the

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1 San Francisco Chronicle. BART Project Hits Brakes for Snakes: Endangered Reptile Shares Road to SFO. Marshall Wilson, July 16, 2000.

United States, including wetlands) complies with state water quality standards, or waive such certification. Section 401 Water Quality Certification is necessary for all 404 Nationwide permits, reporting and non-reporting, as well as individual permits.

All projects must be evaluated for the presence of jurisdictional wetlands and other Waters of the State. Destruction of or impact to these waters should be avoided. If the proposed project impacts wetlands or other Waters of the State and the project applicant is unable to demonstrate that the project was unable to avoid those adverse impacts, water quality certification will most likely be denied. 401 Certification may also be denied based on significant adverse impacts to wetlands or other Waters of the State. In considering proposals to fill wetlands, the Regional Board has adopted the California Wetlands Conservation Policy (Executive Order W-59-93, signed August 23, 1993). The goals of the Policy include ensuring 'no overall net loss and achieving a long-term net gain in the quantity, quality, and permanence of wetlands acreage and values.' Under this Policy, the Regional Board also considers the potential post-construction impacts to wetlands and Waters of the State and evaluates the measures proposed to mitigate those impacts (see Storm Water Quality Control, below).

The Regional Board has adopted U.S. EPA's Clean Water Act Section 404(b)(1) 'Guidelines for Specification of Disposal Sites for Dredge or Fill Material,' dated December 24, 1980, in the Board's Basin Plan for determining the circumstances under which fill may be permitted.

Section 404(b)(1) Guidelines prohibit all discharges of fill material into regulated waters of the United States, unless a discharge, as proposed, constitutes the least environmentally damaging practicable alternative that will achieve the basic project purpose. For non-water dependent projects, the guidelines assume that there are less damaging alternatives, and the applicant must rebut that assumption.

The Section 404(b)(1) Guidelines sequence the order in which proposals should be approached. First, impacts to wetlands or Waters of the State must be avoided to the maximum extent practicable. Second, the remaining impacts must be minimized. Finally, the remaining unavoidable adverse impacts to wetlands or Waters of the State must be mitigated. Mitigation will be preferably in-kind and on-site, with no net destruction of habitat value. A proportionately greater amount of mitigation is required for projects that are out-of-kind and/or off-site. Mitigation will preferably be completed prior to, or at least simultaneous to, the filling or other loss of existing wetlands.

Successful mitigation projects are complex tasks and difficult to achieve. This issue will be strongly considered during agency review of any proposed wetland fill. Wetland features or ponds created as mitigation for the loss of existing jurisdictional wetlands or Waters of the United States cannot be used as storm water treatment controls.

In general, if a proposed project impacts wetlands or Waters of the State and the project applicant is unable to demonstrate that the project was unable to avoid adverse impacts to wetlands or Waters of the State, water quality certification will be denied. 401 Certification may also be

denied based on significant adverse impacts to wetlands or other Waters of the State." (California Regional Water Quality Control Board)

Response: As noted, the proposed project would avoid disturbance of wetlands to the extent possible. If disturbance of wetlands is unavoidable, the SFPUC would comply with all applicable federal and state regulations, which are described in Comments F-6 and F-7 above.

3.0 PULGAS SITE

Comment F-8: "Page IV.C-9, paragraph 3. Clarify whether this description applies to the entire project area, or the immediate vicinity of the temple, and tie the description to Figure IV.C-1." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: The description on DEIR page IV.C-9, paragraphs 2 and 3, applies to the area south and east of the Pulgas Water Temple, which includes a reflecting pool, a wooded area between the western (gated) parking lot, the areas of proposed road widening south of the temple, and the work area adjacent to the overflow channel west of the temple. The area west of the temple, adjacent to the overflow channel, is also described on page IV.C-9, paragraph 3. These areas are shown on DEIR Figure IV.C-1 (page IV.C-8) as CAG (California annual grasslands) habitat adjacent to Cañada Road, ORN (ornamental) habitat to the west, and CAG and CLO (coast live oak woodland) habitat to the south.

Comment F-9: "Page IV.C-19, paragraph 2 in ***Pulgas Site***. Conclusion conflicts with Table IV.C-3 (unnamed creek). The 'wet depressions' shown on Figure IV.C-1 should also be incorporated into this discussion." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: DEIR page IV.C-19, paragraph 2 concludes that the grassland portion of the Pulgas site "does not appear to provide suitable habitat for San Francisco garter snake or California red-legged frog." Table IV.C-3 states that for California red-legged frog, "potential breeding and aestivation habitat occur in an unnamed creek 50 feet north of the preferred dechloramination facility site. Also, known to occur northwest of the dechloramination site." For San Francisco garter snake, "Potential breeding and aestivation habitat occur in an unnamed creek 50 feet north of Pulgas site. Also, known to occur northwest of the site." These statements do not appear conflicting.

The wet depressions are described in the Biological Resources section on DEIR pages IV.C-8 and IV.C-27.

Comment F-10. "Page IV.C-19, last paragraph. Change 'the area surrounding the Pulgas site' to 'the area surrounding the Pulgas Water Temple.'" (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: In response to this comment, and as staff-initiated text changes, DEIR pages IV.C-19 through IV.C-21 have been revised to clarify biological resources information for the Pulgas area. Please see Chapter III of this document.

4.0 TREE IMPACTS

Comment F-11: "Loss of trees- The loss of up to 55 native Oak and Redwood trees is determined to be a less-than-significant impact in the EIR. It is difficult to assess the impact since no information about the size, condition or location of the trees is given. It is stated that these trees have not been identified as a natural community. However, the statement that "numerous large coast live oak trees" would be removed indicates that given the number and size of trees to be removed, the project would result in significant biological and aesthetic impacts. Since there are no mitigation measures proposed, the document does not contain information that would allow the loss of these trees to be considered a less-than-significant impact." (City of San Mateo)

Comments F-12: "Clarify the mitigation for the loss of the coast live oaks." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: In response to these comments, and to clarify DEIR text, DEIR page IV.C-29, paragraph 1 has been revised:

> **Tree Impacts**
>
> Only nonprotected ornamental trees were identified at the Tesla Portal site in San Joaquin County and the Pulgas Balancing Reservoir and Harry W. Tracy WTP sites in San Mateo County. Alameda County protects heritage trees; however, the Sunol Valley project sites are outside of the Alameda *East County Area Plan* sphere of influence (County of Alameda, 1993). No protections are afforded to trees that occur at these sites. Trees at the Pulgas site include cork oak orchard near the Pulgas Water Temple (roughly 10 to 15 trees would be removed), a row of redwood trees growing near the overflow channel (approximately 20 trees would be removed), and ~~numerous~~ large coast live oak trees at the Pulgas site (roughly 10 to 20 trees would be removed). In addition, approximately 10 Lombardy poplars and 25 unidentified ornamental trees (*Prunus* sp.) would be removed at the Pulgas site to accommodate the project. These trees have not been identified as a sensitive natural community in local or regional plans, **or by lists compiled by CDFG or USFWS**. Therefore, removal of trees at the Pulgas site would be considered less than significant.

The coast live oak natural community has a California Department of Fish and Game global ranking of G4 and a state ranking of S4, meaning that populations are secure.[2] As such, the California Department of Fish and Game does not regulate tree removal or removal of this habitat type. Neither the global or state ranking warrant sufficient concern by the state or federal

2 The California Department of Fish and Game global rank (G-rank) is a reflection of the overall condition of an element throughout its global range. The state rank (S-rank) is assigned much the same way as the global rank, except state ranks in California often also contain a threat designation attached to the S-rank.

governments that would require replacement of individual trees. No city or county regulations apply to the removal of nonheritage trees by a public utility.

However, tree removal regulations would apply where willow-riparian and coast live oak riparian forest are impacted by project construction in the unnamed drainage. Tree replacement within this riparian corridor would be required as an element of permitting requirements with the California Department of Fish and Game (CDFG Code, Section 1600 *et seq.*) and U.S. Army Corps of Engineers (Section 404 permit). Mitigation for the removal of these trees is described in Mitigation Measure C-8 for impacts to willow riparian habitat.

Although not required by regulation or as mitigation, replacement of oak trees outside the riparian corridor is under consideration by the SFPUC and could be included as part of the revegetation plan that would be prepared during the project design phase.

5.0 AQUATIC HABITAT

Comment F-13: "Page IV.C-7: Peninsula Aquatic Habitat section should be expanded to include non-fish aquatic species." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: In response to this comment, text on DEIR page IV.C-7, paragraph 2 has been revised:

> **Peninsula Aquatic Habitat**
>
> The three Peninsula sites (Pulgas Balancing Reservoir, Pulgas site, and Harry W. Tracy WTP) discharge water into two natural bodies of water, Upper Crystal Springs Reservoir and San Andreas Reservoir. These coldwater reservoirs and their tributaries serve as habitat for a variety of fish species and other aquatic life. Though there are more nonnative fish species, such as mosquitofish and largemouth bass, native fish species such as resident rainbow trout (*Oncorhynchus mykiss*), Sacramento sucker, and threespine stickleback also occur in the watershed. **In addition to fish species, the reservoirs provide habitat for western toad (*Bufo boreas*) and gopher snake (*Pituophis melanoleucus*), and reservoir fish serve as forage for blue heron (*Ardea herodius*), great egret (*Casmerodius albus*), snowy egret (*Egretta thula*), and other bird species. Aquatic plants provide food-chain support for insect larvae and water bugs such as stoneflies (Plecoptera), mayflies (Ephemoroptera), water beetles (Coleoptera), and true aquatic bugs (Heteroptera).** The aquatic habitats of the reservoirs could be affected in the case of an accidental release of deleterious substances.

6.0 LANDSCAPE PLANTS

Comment F-14: "Page V-9. Monitoring should occur for at least 3 years to ensure cover is established. All weeds that colonize the disturbed areas should be removed during the establishment phase." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: A revegetation plan has not yet been prepared, as it has not been determined to what extent revegetation could be required. Such a plan would be prepared during project design and would include site-specific revegetation details. Mitigation Measure C-8 includes recommended minimum performance standards for the revegetation plan. The stated monitoring period, five years, exceeds that expressed by the commentor. A 100 percent weed control performance criteria, as suggested by the commentor, may be feasible for certain large, noxious weeds (e.g., pampas grass), but is not considered attainable for all weeds. Specific weed abatement protocols would be developed as part of the revegetation plan.

Comment F-15: "Same page [DEIR page V-9]. Change 'landscaping' to 'revegetation.' " (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: In response to this comment, DEIR page V-9, Mitigation Measure C-11 has been revised:

> C-11 As part of the site clearing and grubbing for construction, identified invasive plant species (e.g., yellow-star thistle, purple-star thistle, or french broom) shall be removed prior to seed germination (before June) so that seeds of these plants are not dispersed within the project area. Disturbed natural areas as a result of construction shall be revegetated with appropriate native herbaceous or woody species. Revegetation shall begin as soon as construction-related activities are completed. Monitoring of the seeded herbaceous areas would occur prior to the first wet season following revegetation to ensure that sufficient ground coverage has developed.
>
> Native species should be used in ~~landscaping~~**revegetation**. If nonnative plant species are included in the ~~landscape~~**revegetation** planting palette, certain plants must be avoided. These plants are listed in Table V-1.
>
> Implementation of the Mitigation Measure C-11 would reduce impacts related to invasive landscape plant species to a less than significant level.

Comment F-16: "Table V-1, Change 'German Ivy' to 'Cape Ivy.' " (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: German ivy is synonymous with cape ivy. The Latin name was revised in the late 1990s from *Senecio mikianoides* to *Delairia odorata*. In response to this comment, DEIR page V-10, Table V-1 has been revised.

TABLE V-1
PLANT SPECIES THAT MAY NOT BE USED IN PROJECT LANDSCAPING

Pampas grass (*Cortaderia jubata, C. selloana*)
Tree-of-heaven (*Ailanthus altissima*)
Giant reed (*Arundo donax*)
Bamboo (*Bambusa* spp., *et al*)
Cotoneaster (*Cotoneaster pannosa*)
French broom (*Cytisus monspessulanus*)
Scotch broom (*Cytisus scoparius*)
Blue gum (*Eucalyptus globulus*)
English ivy (*Hedera helix*)
Fig-marigold family members (*Conicosia, Mesembryanthemum*, and *Carpobrotus*)
Tall fescue (*Festuca arundinacea*)
Mattress vine (*Muelenbeckia complexa*)
Tree tobacco (*Nicotiana glauca*)
Fountain grass (*Pennisetum setaceum*)
Pyracantha (*Pyracantha angustifolia*)
Castor bean (*Ricinus communis*)
Black locust (*Robinia pseudoacacia*)
~~German ivy (*Senecio mikianoides*)~~
Cape ivy (*Delaira odorata*)
Spanish broom (*Sparteum junceum*)
Tamarisk (*Tamarix* spp.)
Gorse (*Ulex europaeus*)
Periwinkle (*Vinca major*)
Purple fountain grass (*Pennisetum setaceum)*

SOURCE: ESA, 1999

Comment F-17: "**Biological Resources.** In addition to the following items, GGNRA staff would appreciate the opportunity to review the landscape plant list for the Pulgas site when it becomes available." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Comment F-18: "The GGNRA would appreciate the opportunity to be involved in establishing mitigation goals/criteria for vegetation communities and to review the selected mitigation measures." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: Comments F-17 and F-18 are noted. The SFPUC could make the revegetation plan and mitigation goals/criteria available for review at the time they are prepared. The SFPUC would consider comments on the revegetation plan and mitigation goals/criteria.

G. HYDROLOGY AND WATER QUALITY

1.0 ALAMEDA CREEK

Comment G-1: "Thank you for the opportunity to comment on the Draft Environmental Impact Report (DEIR) for the Hetch Hetchy Water Treatment Chloramine Conversion Project. The Alameda County Water District (ACWD) is a special district providing water service to over 318,250 people in the cities of Fremont, Newark, and Union City. Although the amount varies depending on hydrologic conditions, in past years, ACWD has relied on Alameda Creek to provide in excess of 30,00 acre-feet of local and imported water for groundwater replenishment. The water is percolated into the Niles Cone Groundwater Basin (downstream of Niles Canyon) through percolation both in Alameda Creek itself and the adjacent Quarry Lakes recharge area. The water is subsequently recovered through ACWD's groundwater production wells and provided as potable supply to ACWD customers. Protection of the Alameda Creek Watershed, an area that encompasses key facilities proposed in the subject project, is very important in order to preserve and enhance the water resources available to ACWD." (Alameda County Water District)

Response: As one of the Bay Area Water Users Association (BAWUA) member agencies, the Alameda County Water District (ACWD) will be included in the BAWUA and public outreach program, and the SFPUC will continue to notify the ACWD about the chloramine conversion program. The SFPUC, as purveyors of water in the Alameda Creek watershed, is also committed to protecting and maintaining water quality within the watershed. In addition, Improvement Measures N-4 and N-5 would provide further coordination with BAWUA member agencies (see DEIR page V-20).

2.0 AMMONIA TOXICITY

Comment G-2: "Page IV.D-16. In the discussion of Ammonia Toxicity, it is unclear how the assumed instantaneous mixing and pH and temperature equilibrium in the receiving water will occur." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Comment G-3: "The estimated un-ionized ammonia concentration is much lower than the limit established in the Board's Basin Plan. However the assumptions and calculations used to arrive at this figure are not included in DEIR. These must be presented along with the estimated concentration in order for that figure to be credible." (California Regional Water Quality Control Board)

Comment G-4: "The DEIR should include the assumptions and calculations leading to the estimated maximum concentration of unionized ammonia that may be discharged to surface waters during overflows." (California Regional Water Quality Control Board)

Comment G-5: "Project Description-Pulgas Site. Section III.D.20 (Page III-6, paragraph 3): The basis for the RWQCB objectives for ammonia should be discussed. The degree of ammonia removal should be fully protective of aquatic organisms, not simply compliant with RWQCB objectives." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: As described on Draft EIR page IV.D-9, the RWQCB is responsible for protection of water quality in the San Francisco Bay Area, and to this effect has established water quality objectives to protect and maintain aquatic resources. The applicable RWQCB water quality objectives that apply to the Pulgas Site project area are for the Lower San Francisco Bay Region. These include a specific water quality objective for un-ionized ammonia, the toxic form of ammonia. The RWQCB water quality objective for un-ionized ammonia is 0.40 mg/L; this is the maximum un-ionized ammonia concentration that the RWQCB considers allowable for protection of aquatic resources in receiving waters. The RWQCB objectives are designed to be fully protective of a waterway's beneficial uses, which in the case of Upper Crystal Springs Reservoir, includes aquatic habitat. As part of the proposed project, the SFPUC would comply with the RWQCB water quality objectives, including the objective for un-ionized ammonia; therefore, discharges to Upper Crystal Springs Reservoir would be considered fully protective of aquatic organisms. It is not within the scope of this EIR to explain or justify the basis for the RWQCB objectives.

Draft EIR pages IV.D-15 through IV.D-16 discuss potential ammonia toxicity, related to the proposed project. This analysis is based on the chemical properties of ammonia, the proposed ammonia dosage, and the ambient conditions in the water system and in the reservoir. (See Chapter III of this document for staff-initiated text changes regarding ambient reservoir conditions.) The discussion concludes that the proposed project would comply with RWQCB water quality objectives for un-ionized ammonia and therefore would not result in toxic conditions for the aquatic habitat in Upper Crystal Springs Reservoir.

When ammonia is dissolved in water, it breaks down (dissociates) into two forms: the ionized form and the un-ionized form. Total ammonia is the sum of both un-ionized and ionized ammonia. Ammonia in the un-ionized form is toxic to aquatic organisms, while the ionized form of ammonia is considerably less toxic. The relative concentrations of the two forms of ammonia depend mainly upon the pH and temperature of the water, where the percentage of un-ionized ammonia increases as the pH and temperature of the water increase. To a lesser extent, the salinity of water also affects the relative concentration of un-ionized ammonia, where the percentage of un-ionized ammonia decreases with increased salinity. Table 1 shows the percentage of un-ionized ammonia over a range of pH and temperature conditions; these percentages were used to calculate the maximum possible concentrations of un-ionized ammonia (shown in bold in Table 1) that could be present in both the discharge water and in the receiving water under the proposed project.

The proposed project would inject a maximum dosage of 0.50 mg/L of total ammonia into the water supply system. This ammonia would dissociate into the un-ionized and ionized forms, with

TABLE 1
PERCENT UN-IONIZED AMMONIA IN AQUEOUS AMMONIA SOLUTIONS FOR A RANGE OF TEMPERATURE AND pH

Temp.	pH								
(C)	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
0	.00827	.0261	.0826	.261	.820	2.55	7.64	20.7	45.3
1	.00899	.0284	.0898	.284	.891	2.77	8.25	22.1	47.3
2	.00977	.0309	.0977	.308	.968	3.00	8.90	23.6	49.4
3	.0106	.0336	.106	.335	1.05	3.25	9.60	25.1	51.5
4	.0115	.0364	.115	.363	1.14	3.52	10.3	26.7	53.5
5	.0125	.0395	.125	.394	1.23	3.80	11.1	28.3	55.6
6	.0136	.0429	.135	.427	1.34	4.11	11.9	30.0	57.6
7	.0147	.0464	.147	.462	1.45	4.44	12.8	31.7	59.5
8	.0159	.0503	.159	.501	1.57	4.79	13.7	33.5	61.4
9	.0172	.0544	.172	.542	1.69	5.16	14.7	35.3	63.3
10	.0186	.0589	.186	.586	1.83	5.56	15.7	37.1	65.1
11	.0201	.0637	.201	.633	1.97	5.99	16.8	38.9	66.8
12	.0218	.0688	.217	.684	2.13	6.44	17.9	40.8	68.5
13	.0235	.0743	.235	.738	2.30	6.92	19.0	42.6	70.2
14	.0254	.0802	.253	.796	2.48	7.43	20.2	44.5	71.7
15	.0274	.0865	.273	.859	2.67	7.97	21.5	46.4	73.3
16	.0295	.0933	.294	.925	2.87	8.54	22.8	48.3	74.7
17	.0318	.101	.317	.996	3.08	9.14	24.1	50.2	76.1
18	.0343	.108	.342	1.07	3.31	9.78	25.5	52.0	77.4
19	.0369	.117	.368	1.15	3.56	10.5	27.0	53.9	78.7
20	.0397	.125	.396	1.24	3.82	11.2	**28.4**	55.7	79.9
21	.0427	.135	.425	1.33	4.10	11.9	29.9	57.5	81.0
22	.0459	.145	.457	1.43	4.39	12.7	31.5	59.2	82.1
23	.0493	.156	.491	1.54	4.70	13.5	33.0	60.9	83.2
24	.0530	.167	.527	1.65	5.03	**14.4**	34.6	62.6	84.1
25	.0569	.180	.566	1.77	5.38	15.3	36.3	64.3	85.1
26	.0610	.193	.607	1.89	5.75	16.2	37.9	65.9	85.9
27	.0654	.207	.651	2.03	6.15	17.2	39.6	67.4	86.8
28	.0701	.221	.697	2.17	6.56	18.2	41.2	68.9	87.5
29	.0752	.237	.747	2.32	7.00	19.2	42.9	70.4	88.3
30	.0805	.254	.799	2.48	7.46	20.3	44.6	71.8	89.0

Note: From Emerson et al. 1975; reproduced from the Journal of the Fisheries Research Board of Canada, as referenced in San Francisco Water Team, prepared for San Francisco Public Utilities Commission, *Hetch Hetchy Water Treatment Project, Phase 1A Preliminary Engineering Report*, 1996. Appendices, Technical Memorandum No. 1.

the relative concentration depending on the pH and temperature of the water supply system. The pH of the SFPUC water supply system ranges from 7.5 to 9.0, and the temperature ranges from 10 to 20 degrees Celsius (°C). The conditions resulting in the highest percentage of un-ionized ammonia would occur with the highest pH (9.0) and the highest temperature (20°C); this combination of conditions has been determined to cause about 28.4 percent of the total ammonia to be in the un-ionized form (see Table 1). Therefore, under worst-case conditions with no removal of ammonia (i.e., system failure), the maximum concentration of un-ionized ammonia in the water supply system would be 28.4 percent of the maximum dosage of total ammonia of 0.50 mg/L. The calculated result is a maximum concentration of 0.14 mg/L of un-ionized ammonia in the water supply system. This concentration is well below the RWQCB maximum limit of 0.40 mg/L and would not be considered toxic to aquatic organisms. At the proposed Pulgas dechloramination facility, total ammonia levels would be reduced by up to 90 percent through the dechloramination process, so that under normal operating conditions, the discharge to Upper Crystal Springs Reservoir would contain considerably lower concentrations of un-ionized ammonia than 0.14 mg/L. Any discharge from the proposed dechloramination facility to Upper Crystal Springs Reservoir, including discharge during a system failure event, would be well below toxic levels of un-ionized ammonia.

The Upper Crystal Springs Reservoir has a typical pH range of 6.5 to 8.5, and a temperature range of 10 to 24 degrees Celsius. When discharges from the proposed dechloramination facility are mixed with the ambient water in Upper Crystal Springs Reservoir, the concentration of total ammonia would be diluted and the relative concentration of un-ionized ammonia would depend on the pH and temperature of the ambient water. The reservoir conditions resulting in the highest percentage of un-ionized ammonia would occur with the highest pH (8.5) and the highest temperature (24°C), or about 14.4 percent of the total ammonia (see Table 1). Therefore, under worst-case conditions—which represent an extreme upper limit that would occur only in the unlikely event that the dechloramination system fails (i.e., no ammonia is removed) at the same time that the reservoir experiences the highest pH and temperature conditions of its typical range—the maximum concentration of un-ionized ammonia that could be present in Upper Crystal Springs Reservoir, assuming no mixing, would be 14.4 percent of 0.50 mg/L, or 0.072 mg/L. This concentration is well below the RWQCB maximum limit of 0.40 mg/L and would not be considered toxic to aquatic organisms.

The addition of ammonia to both the discharge and the reservoir would result in concentrations of un-ionized ammonia well below the toxic level; thus, any mixing of the two waters would also result in concentrations below toxic levels. Since mixing would readily occur with the turbulence of the discharge waters, it would be expected that equilibrium conditions with the ambient water would occur fairly rapidly. In any event, neither the discharge, the ambient reservoir waters, nor the two combined would contain levels of un-ionized ammonia in excess of the RWQCB water quality objective. Therefore, as stated on Draft EIR page IV.D-16, the proposed project would not result in toxic ammonia conditions in Upper Crystal Springs Reservoir under normal operating conditions or even under system upset conditions.

Table 2 summarizes the calculations of maximum, worst-case scenario concentrations of un-ionized ammonia that could be present in the discharge and in Upper Crystal Springs Reservoir as a result of the proposed project.

TABLE 2
MAXIMUM, WORST-CASE SCENARIO
UN-IONIZED AMMONIA CALCULATIONS

Maximum Total Ammonia Concentration	pH Range	Temperature Range	Maximum Percent Un-Ionized Ammonia (from Table 1)[a]	Maximum Un-Ionized Ammonia Concentration[b]
Proposed Dechloramination Facility Discharge (assumes no ammonia removal, i.e., system failure)				
0.50 mg/L	7.5	10° C	0.586%	0.003 mg/L
0.50 mg/L	7.5	20° C	1.24%	0.006 mg/L
0.50 mg/L	9.0	10° C	15.7%	0.079 mg/L
0.50 mg/L	9.0	20° C	28.4%	0.142 mg/L
Upper Crystals Springs Reservoir (assumes no mixing and no ammonia removal)				
0.50 mg/L	6.5	10° C	0.589%	0.003 mg/L
0.50 mg/L	6.5	24° C	0.167%	0.008 mg/L
0.50 mg/L	8.5	10° C	5.56%	0.028 mg/L
0.50 mg/L	8.5	24° C	14.4%	0.072 mg/L

[a] Assumes zero salinity, resulting in the worst-case un-ionized ammonia scenario.
[b] The RWQCB Basin Plan water quality objective for maximum un-ionized ammonia in the project area is 0.40 mg/L.

SOURCE: ESA+Orion, 2000

3.0 PULGAS BALANCING RESERVOIR

Comment G-6: "**PULGAS BALANCING RESERVOIR.** Overflows of treated water from this reservoir flow through the unnamed drainage that has been identified as Endangered Species habitat. Special consideration should be given to ensure that the water quality (undiluted by the reservoir) in this small drainage meet appropriate criteria." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: Currently, overflows of treated water occur at the Pulgas Balancing Reservoir about once a year to the unnamed drainage south of the Pulgas Water Temple parking lot (see DEIR page IV.D-19). As described in the EIR, these overflows will be dechlorinated as part of the SFPUC Pulgas Dechlorination Facility Project, which is a separate project that is discussed in the DEIR in the section entitled "Summary of Cumulative Environmental Effects" (see DEIR pages VI-4 through VI-5); the design of this project has been completed and the project is pending final environmental and funding approval. If that project is delayed or cancelled due to funding or other considerations, the dechlorination facilities for the Pulgas Balancing Reservoir would be incorporated into this proposed project for chloramine conversion. Therefore, all discharge of chlorinated compounds from the balancing reservoir to the unnamed drainage would be eliminated. As discussed on Draft EIR page IV.D-19, any residual ammonia remaining in the overflows from the balancing reservoir would be discharged to the unnamed drainage. However, levels of residual ammonia in the discharge would be well below toxic levels established by the RWQCB in the Basin Plan (discussed on DEIR pages IV.D-15 and IV.D-16 and also under Section G.2.0, Ammonia Toxicity, above); therefore, the discharge would be protective of aquatic habitats and associated wildlife.

4.0 HARRY W. TRACY WTP

Comment G-7: "**HARRY W. TRACY WTP.** The rationale for not including ammonia removal should be expanded to protect the aquatic system in the immediate vicinity of the discharge." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Comment G-8: "This drainage should also be addressed explicitly under Water Quality Degradation from a Chemical Spill." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: At the Harry W. Tracy WTP, periodic overflows of treated water are discharged to San Andreas Reservoir, as discussed on Draft EIR pages IV.D-19 and IV.D-20. These discharges occur at the adit structure, which is the same location where raw water is drawn into the raw water pump station. This indicates that in the immediate vicinity of the discharge, the existing aquatic system has adapted to the ongoing active turnover and exchange of raw water and treated water. With the proposed project, there would be no change in water exchange or turnover rates. Periodic overflows of chlorinated water would continue to occur, but would be dechlorinated prior to discharge to San Andreas Reservoir at a permanent dechlorination facility built as part of this project. As noted on DEIR page IV.D-19, under the proposed project chloraminated water could overflow from treated water reservoirs and then enter San Andreas Reservoir. However, it is anticipated that the overflows would rarely occur, and the volumes of the overflows would be small. The amount of residual ammonia entering San Andreas Reservoir from these overflows would not be sufficient to cause algal stimulation. The results of calculations similar to those described in the response to Comments G-2 through G-5 would be expected to reinforce the conclusion that periodic overflow of chloraminated water to the reservoir would not exceed the RWQCB objective for un-ionized ammonia. Furthermore, the Draft EIR includes a mitigation

measure for monitoring ammonia levels and implementing appropriate nutrient management techniques to protect aquatic habitats from residual levels of ammonia in overflows to San Andreas Reservoir (see page V-7, Mitigation Measure C-8). Therefore, with implementation of the mitigation measures, potential impacts to aquatic habitats at San Andreas Reservoir would be less than significant.

The potential for a chemical spill at the Harry W. Tracy WTP is discussed on Draft EIR page IV.D.21. As indicated in the discussion, the proposed project would include state-of-the-art design features for monitoring and secondary containment at all chemical handling facilities and site-specific hazardous materials business plans; therefore, this impact would be less than significant for all project sites, including the drainage in the vicinity of the Harry W. Tracy WTP. There would be no possibility of a chemical spill at the discharge outlet at the Harry W. Tracy WTP, since chemical handling and containment facilities would be located well upstream of this portion of the flow.

5.0 CHLORAMINE TOXICITY

Comment G-9: "Page IV.D-16. Add references to the discussion of Chloramine Toxicity. Clarify what the statement 'chloramine may react with aquatic organisms.' The concluding statement is misleading. Infrequent discharges do not eliminate ammonia toxicity." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: The text on Draft EIR page IV.D-16 has been revised as follows to clarify and to provide references regarding the discussion of chloramine toxicity:

> ***Chloramine Toxicity***
>
> Chloramine is regulated in the Basin Plan as a form of chlorine. Like chlorine and ammonia, chloramine is toxic to aquatic life due to its reactive nature. Chloramine has been shown to be toxic to both fish and invertebrates **(aquatic animals that take water directly into their system, such as through gills),** and **it** is generally more stable and more persistent than chlorine. Studies have shown that toxicity of chloramine, similar to that of chlorine, appears to be influenced by pH, with lower toxic effects with lower pH. If discharged into natural waters, chloramine may ~~react with~~**result in toxic conditions to** aquatic organisms**, depending on the concentration and ambient conditions (SFWT, 1996)**. Additionally, the use of chloramine can introduce both chlorine and ammonia into natural waters, either as free ions or through disassociation of the chloramine molecule after its introduction to natural waters. Depending on the frequency and volume of anticipated discharges, either dechlorination or dechloramination of discharges to natural waters is proposed as part of the project. In ~~most~~ locations where discharges **to natural waters occur**~~are infrequent or small in volume~~, removal of **all of**~~only~~ the **residual** chlorine ~~chloramine~~, ~~(~~**as proposed through** dechlorination **or dechloramination,**~~) is sufficient to~~ **would** eliminate toxicity **associated with chloramine**. **Therefore,**

since the proposed project would remove all residual chlorine at all discharges to natural waters, the project would be in compliance with Basin Plan requirements and would provide protection of aquatic organisms from chloramine toxicity.

In addition, the following has been added as the third reference on DEIR page IV.D-29:

San Francisco Water Team (SFWT), prepared for San Francisco Public Utilities Commission, Hetch Hetchy Water Treatment Project, Phase 1A Preliminary Engineering Report, 1996. Appendices, Technical Memorandum No. 1, Chloramine Toxicity.

6.0 CHLORINE RESIDUAL

Comment G-10: "Page IV.D-18-19. Pulgas Site. Clarify if the chlorine residual regulatory level is protective for chloramine toxicity. Clarify how 90% removal translates to discharge concentrations." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: The Basin Plan effluent limitation for residual chlorine, as free chlorine plus chloramine, is 0.0 mg/L as the instantaneous limit, which is designed to be fully protective of aquatic organisms. The proposed project would meet this limit by designing the project for 100 percent removal of chlorine at all sites that discharge to surface water bodies, in full compliance with the RWQCB regulatory limits in the Basin Plan. At all sites, the proposed project would also be in full compliance with RWQCB water quality objectives for un-ionized ammonia. At the Pulgas dechloramination facility, the project is also proposing as much as 90 percent removal of ammonia to prevent biostimulatory effects in Upper Crystal Springs Reservoir, as described on DEIR page IV.D-19.

7.0 COPPER SOLVENCY

Comment G-11: "However, the potential impact of switching to chloramine is not addressed in the context of increased cuprosolvency that may be experienced in the distribution system. We are also concerned that the solvency of other metals present in the system may be increased such as lead, tin and zinc. According to the US Environmental Protection Agency's (EPA) Lead and Copper Rule for drinking water quality, the concentrations of lead and copper should not exceed (action level) 0.015 mg/L and 1.3 mg/L respectively (EPA 812-F-96-002). We are particularly concerned about copper because any increased amount in discharges may be harmful to listed salmonids.

The San Francisco Bay is currently listed under section 303 (d) of the Clean Water Act as having impaired water quality due to excessive copper concentrations. This means that the water body has exceeded its capacity to assimilate additional, identified wasteloads. The concentration of copper that may be present in water bodies identified as marine is 3.1 µ/L for continuous chronic exposure. In waterbodies identified as freshwater (which may be the discharge point for several

users of this water) the allowable chronic concentration is 9 μ/L with an acute criteria concentration of 13 μ/L.

In California, the State Water Resources Control Board and the Regional Water Quality Control Boards are responsible for ensuring that the ambient water quality standards are met. The San Francisco Bay Regional Water Quality Control Board (Regional Board) is tasked, in cooperation with the US EPA, in developing a Total Maximum Daily Load (TMDL) plan to reduce the concentration and mass of copper found in the Bay. Through this program, individual discharges (industrial facilities and wastewater treatment plants) are assigned a set amount of copper that they may discharge. An allotment is also made for nonpoint sources. This chloramine conversion project needs to be analyzed by the Regional Board to determine if it will deleteriously affect their TMDL development as well as adding an additional amount of harmful copper, and possibly other contaminants, to the San Francisco Bay through the local treatment works. The local treatment works will have to determine if they can handle and treat the additional loading without violating the requirements in their discharge permits.

This particular concern stems from reports of increased cuprosolvency in water systems that have switched to chloramine for their residual disinfection. The most notable report concerned the City of Tucson, Arizona. A report by the Tucson Regional Water Council states, 'Chloramine increased the corrosion of copper and copper alloy pipes.' It also states that 'Chloramine attacks certain elastomer fittings in household plumbing such as the joints in plastic pipes and plastic or rubber toilet flappers.' This report is found at www.azstarnet.com/~trwc/rwtpc.htm.

Copper solubility was also enhanced in the presence of excess ammonia from the chloramination process in Champaign, Illinois when their system was converted to chloramine. Reference to this study is found in an EPA document that may provide useful in your analysis, EPA/600/R-95/085, Effect of pH, DIC, Orthophosphate and Sulfate on Drinking Water Cuprosolvency."
(United States Department of Commerce)

Response: The American Water Works Association Research Foundation (AWWARF) is the water industry leader in research covering all areas of water supply and treatment, operation, and utility management in North America. Based on AWWARF research and publications on the impacts of chloramine on elastomeric and metallic/alloy plumbing materials, the proposed chloramine conversion of the SFPUC water system is not anticipated to affect the corrosion rate or solvency of copper in the water for the following reasons: (1) pH was found to be the most important determinant of corrosion rates, and higher corrosion rates of copper were observed in the presence of free chlorine or chloramine only at low pH of 6 or less, and the SFPUC water system maintains a pH greater than 8; (2) at the pH of the water in the distribution system, the concentration of chlorine, either combined or free, was found to have no effect on corrosion; (3) free chlorine was found to exert a higher oxidant effect on copper pipe than chloramines at equivalent concentrations; and (4) ammonia or ammonium have little effect on corrosion of copper alloys, and free ammonia in the distribution system at levels associated with use of chloramines has no effect on copper corrosion. Therefore, since chloramine conversion would not affect levels of copper in the water supply distribution system, the proposed project would have no effect on the levels of copper in the wastewater discharges to the Bay.

The SFPUC drinking water supply is currently in full compliance with copper levels regulated under the Lead and Copper Rule. The concentration of copper measured in the SFPUC system has ranged from 0.02 to 0.13 mg/L (or 20 to 130 μg/L), which is well below the action level of 1.3 mg/L (or 1,300 μg/L). Therefore, there are currently no water quality issues associated with copper levels in the drinking water supply, and for reasons stated above, there would be no changes with the proposed project.

The current National Pollutant Discharge Elimination System (NPDES) permit for discharges of treated wastewater to San Francisco Bay from the Southeast Water Pollution Control Plant sets a maximum discharge limit of final effluent copper concentration of 37 μg/L. In the three-year period from 1997 through 1999, the measured concentration of copper in the final effluent from the Southeast Water Pollution Control Plant ranged from 4.9 to 29.6 μg/L, which is well below the discharge limit in the NPDES permit. As described above, the proposed project would not be expected to affect the level of copper in wastewater discharges. Therefore, since the copper discharges are in compliance with the NPDES permit and would continue to be so after implementation of the proposed project, the proposed project would have no effect on copper loading to the Bay or on the RWQCB's Total Maximum Daily Load plan.

As noted by the commentor, chloramine is known to cause deterioration of certain types of rubber. DEIR page II-5 describes this process and notes that some commonly used household plumbing seals in hot water tanks and toilet flap valves would require replacement with a different type of rubber once deterioration occurs. The SFPUC public outreach program will address this indirect effect and will provide information on ways to safeguard against potential problems.

8.0 DISCHARGES TO BAY

Comment G-12: "Our concern with the project is the potential effect of using chloramine for disinfection on the quality of wastewater discharged to the San Francisco Bay and through ocean outfalls in the vicinity of the Bay." (United States Department of Commerce)

Comment G-13: "Page IV.D-27. End-Use. Most Presidio storm drainage is discharged untreated. When SFPUC water is used outdoors as irrigation, the chloramine residual goes untreated and runoff may be discharged into storm drains." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: The Initial Study prepared for this project, and attached as DEIR Appendix A, includes an analysis of the effects of chloramine on wastewater discharges to the Bay, including discharges from the wastewater treatment plants, from combined sewer overflows, and from nonpoint discharges to the Bay (refer to Appendix A pages 35 and 36). As described in the Initial Study, the levels of chloramines in treated wastewater associated with the proposed disinfection process would result in less than significant impacts to water quality and the Bay. This is because wastewater is dechlorinated prior to discharge to the Bay and because levels of ammonia associated with the disinfection process would be within the normal variation of ammonia levels typically present in wastewater (less than 2 percent). Similarly, chloramines in combined sewer

discharges would constitute a negligible percentage when considered relative to the level of ammonia typically present in these discharges (composed of wastewater diluted with rainwater). Draft EIR page IV.D-27 also includes an assessment of end use of chloraminated water, such as outdoor irrigation, where chloraminated water may enter storm drains. As stated in the EIR, the volumes of this type of discharge are generally not large enough to threaten waterways. In addition, the chloramine in such discharges dissipates through contact with lawns and soils. Therefore, even in areas such as the Presidio where storm drains flow directly to the Bay without treatment, the discharges would not be anticipated to affect water quality or result in toxic conditions due to the low volumes and the low levels of chloramine after it dissipates through contact with vegetation and soils.

9.0 EROSION CONTROL

Comment G-14: "While the erosion and sediment control measures proposed in the DEIR appear thorough and laudable, they are not described in sufficient detail to ensure that erosion and sedimentation of surface waters will not result. The project proponent should describe the specific erosion and sediment control measures to be implemented during the project's construction. Those described in the SFPUC construction specifications for erosion and sediment control appear adequate." (California Regional Water Quality Control Board

Comment G-15: "The DEIR should specify all stormwater and erosion control BMPs to be implemented during and after the construction of the project. (California Regional Water Quality Control Board)

Comment G-16: "**Erosion.** The project should minimize erosion and control sediment during and after construction. This should be done by developing and implementing an erosion control plan, or equivalent plan. This plan should be included in the SWPPP. The plan should specify all control measures that will be used or which are anticipated to be used, including but not limited to, the following:

- Limit access routes and stabilize access points.
- Stabilize denuded areas as soon as possible with seeding, mulching, or other effective methods.
- Protect adjacent properties with vegetative buffer strips, sediment barriers, or other effective methods.
- Delineate clearing limits, easements, setbacks, sensitive areas, vegetation and drainage courses by marking them in the field.
- Stabilize and prevent erosion from temporary conveyance channels and outlets.
- Use sediment controls and filtration to remove sediment from water generated by dewatering or collected on-site during construction. For large sites, stormwater settling basins will often be necessary." (California Regional Water Quality Control Board)

Response: The EIR describes proposed erosion and sediment control measures on pages IV.D-14 and IV.D-15. The SFPUC would implement these measures, in addition to the required Storm Water Pollution Prevention Plan at the Pulgas site, as part of the proposed project, which would reduce potential erosion and sedimentation impacts to less than significant. The SFPUC would incorporate standard construction specifications for erosion and sediment control

as part of contract specifications and would implement best management practices to the extent feasible at all construction sites to eliminate or minimize erosion. The best management practices would include measures such as: limiting access routes and stabilizing access points; stabilizing denuded areas as soon as possible; protecting adjacent properties with vegetative buffer strips or sediment barriers; delineating clearing limits, easements, setbacks, sensitive areas, vegetation, and drainage courses in the field; stabilizing and preventing erosion from temporary conveyance channels; and using sediment controls and filtration to remove sediment from water generated by dewatering or collected on-site during construction.

10.0 NPDES PERMIT REQUIREMENTS

Comment G-17: "**NPDES.** Water quality degradation is regulated by the Federal National Pollutant Discharge Elimination System (NPDES) Program, established by the Clean Water Act, which controls and reduces pollutants to water bodies from point and nonpoint discharges. In California, the program is administered by the California Regional Water Quality Control Boards. The Regional Board issues NPDES permits for discharges to water bodies in the San Francisco Bay Area, including Municipal (area- or county-wide) Stormwater Discharge Permits.

Projects disturbing more than five acres of land during construction must be covered under the State NPDES General Permit for Discharges of Storm Water Associated with Construction Activity (General Permit). This can be accomplished by filing a Notice of Intent with the State Water Resources Control Board. An NOI and the General Permit can be obtained from the Board at (510) 622-2300. The project sponsor must propose and implement control measures that are consistent with the General Permit and with the recommendations and policies of the local agency and the RWQCB.

Projects that include facilities with discharges of Storm Water Associated with Industrial Activity must be covered under the State NPDES General Permit for Discharges of Storm Water Associated with Industrial Activity. This may be accomplished by filing a Notice of Intent. The project sponsor must propose control measures that are consistent with this, and with recommendations and policies of the local agency and the RWQCB. In a few cases, the project sponsor may apply for (or the RWQCB may require) issuance of an individual (industry- or facility-specific) permit.

The RWQCB's Urban Runoff Management Program requires Bay Area municipalities to develop and implement storm water management plans (SWMPs). The SWMPs must include a program for implementing new development and construction site storm water quality controls. The objective of this component is to ensure that appropriate measures to control pollutants from new development are considered during the planning phase, before construction begins; implemented during the construction phase; and maintained after construction, throughout the life of the project." (California Regional Water Quality Control Board)

Response: The proposed project would comply with all aspects of the NPDES program that are applicable to a project of this nature, including the General Permit for stormwater discharges from construction sites greater than five acres.

11.0 STORMWATER CONTROLS AND BEST MANAGEMENT PRACTICES

Comment G-18: "**Site Planning.** The project should minimize impacts from project development by incorporating appropriate site planning concepts. This should be accomplished by designing and proposing site planning options as early in the project planning phases as possible. Appropriate site planning concepts to include, but are not limited to the following:

- Phase construction to limit areas and periods of impact.
- Minimize directly connected impervious areas.
- Preserve natural topography, existing drainage courses and existing vegetation.
- Locate construction and structures as far as possible from streams, wetlands, drainage areas, etc.
- Provide undeveloped, vegetated buffer zones between development and streams, wetlands, drainage areas, etc.
- Reduce paved area through cluster development, narrower streets, use of porous pavement and/or retaining natural surfaces.
- Minimize the use of gutters and curbs which concentrate and direct runoff to impermeable surfaces.
- Use existing vegetation and create new vegetated areas to promote infiltration.
- Design and lay out communities to reduce reliance on cars.
- Include green areas for people to walk their pets, thereby reducing build-up of bacteria, worms, viruses, nutrients, etc. in impermeable areas, or institute ordinances requiring owners to collect pets' excrement.
- Incorporate low-maintenance landscaping.
- Design and lay out streets and storm drain systems to facilitate easy maintenance and cleaning.
- Consider the need for runoff collection and treatment systems.
- Label storm drains to discourage dumping of pollutants into them." (California Regional Water Quality Control Board)

Comment G-19: "**Chemical and Waste Management.** The project should minimize impacts from chemicals and wastes used or generated during construction. This should be done by developing and implementing a plan or set of control measures. The plan or control measures should be included in the SWPPP. The plan should specify all control measures that will be used or which are anticipated to be used, including, but not limited to, the following:

- Designated specific areas of the site, away from streams or storm drain inlets, for storage, preparation, and disposal of building materials, chemical products, and wastes.
- Store stockpiled materials and wastes under a roof or plastic sheeting.
- Store containers of paint, chemicals, solvents, and other hazardous materials stored in containers under cover during rainy periods.
- Berm around storage areas to prevent contact with runoff.
- Cover open dumpsters securely with plastic sheeting, a tarp, or other cover during rainy periods.
- Designate specific areas of the site, away from streams or storm drain inlets, for auto and equipment parking and for routine vehicle and equipment maintenance.
- Routinely maintain all vehicles and heavy equipment to avoid leaks.

- Perform major maintenance, repair, and vehicle and equipment washing off-site, or in designated and controlled areas on-site.
- Collect used motor oil, radiator coolant or other fluids with drip pans or drop cloths.
- Store and label spent fluids carefully prior to recycling or proper disposal.
- Sweep up spilled dry materials (cement, mortar, fertilizers, etc.) immediately--do not use water to wash them away.
- Clean up liquid spills on paved or impermeable surfaces using 'dry' cleanup methods (e.g., absorbent materials, cat litter, rags) and dispose of cleanup materials properly.
- Clean up spills on dirt areas by digging up and properly disposing of the soil.
- Keep paint removal wastes, fresh concrete, cement mortars, cleared vegetation, and demolition wastes out of gutters, streams, and storm drains by using proper containment and disposal." (California Regional Water Quality Control Board)

Comment G-20: "Post-Construction. The project should minimize impacts from pollutants that may be generated by the project following construction, when the project is complete and occupied or in operation. These pollutants may include: sediments, bacteria, metals, solvents, oil, grease, and pesticides, all of which are typically generated during the life of a residential, commercial, or industrial project after construction has ceased. This should be done by developing and implementing a plan and set of control measures. The plan or control measures should be included in the SWPPP.

The plan should specify all control measures that will be used or which are anticipated to be used, including, but not limited to, the source controls and treatment controls listed in the Recommendations. Appropriate control measures are discussed in the Recommendations, in:

- Table 2: Summary of residential post-construction BMP selection
- Table 3: Summary of industrial post-construction BMP selection
- Table 4: Summary of commercial post-construction BMP selection

Additional sources of information that should be consulted for BMP selection include the *California Storm Water Best Management Practice Handbooks*; the Bay Area Preamble to the *California Storm Water Best Management Practice Handbooks and New Development Recommendations*; the BASMAA New Development Subcommittee meetings, minutes, and distributed information; and Regional Board staff. Regional Board staff also have fact sheets and other information available for a variety of structural stormwater treatment controls, such as grassy swales, porous pavement and extended detention ponds." (California Regional Water Quality Control Board)

Response: The proposed project would incorporate water quality control measures and best management practices to the extent feasible during site planning, construction, and post construction. Measures for chemical and waste management during construction are typically incorporated into standard construction specifications. The SFPUC would implement as many feasible measures recommended in RWQCB Comments G-18, G-19, and G-20, as applicable to the proposed project at each facility site.

12.0 AGENCY NOTIFICATION

Comment G-21: "Finally, the SFPUC should state in the DEIR that Board staff will be notified every time a discharge occurs." (California Regional Water Quality Control Board)

Response: The SFPUC conducts reporting and notification to the RWQCB as required by its NPDES permits and other water quality regulations. RWQCB notification is not required every time a discharge occurs. However, the SFPUC must notify the RWQCB that discharges may occur (such as filing a report of waste discharges, if required), and the RWQCB would determine whether permits and additional reporting are necessary. Otherwise, notification is required only when the discharge violates a particular standard or prohibition, or when notification is specifically required under a permit issued by the RWQCB.

13.0 OPERATIONAL STORMWATER CONTROL

Comment G-22: "The project would cause an increase in the volume and velocity of stormwater runoff, which, while individually limited in its effects, may be cumulatively significant in the context of other development in the affected watersheds. To reduce this impact, the SFPUC should develop a long-term SWPPP to be effective for the life of the project. This SWPPP should include the on-site capture and treatment of 80-90% of each site's estimated average annual runoff. More information on stormwater control is included in the Board's general comments (attached)." (California Regional Water Quality Control Board)

Comment G-23: "The DEIR should include long-term stormwater measures for all sites in the SWPPP, including the treatment of 80-90% of each site's average annual runoff for the life of the project." (California Regional Water Quality Control Board)

Comment G-24: "**Hydrology and Water Quality.** The increase in stormwater runoff (p. IV.D-23) should be considered for the small unnamed drainage to ensure that erosion will not be induced there." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Comment G-25: "Regional Board staff encourage the project proponent and the lead agency to refer to a copy of 'Start at the Source,' a design guidance manual for storm water quality protection, which provides innovative ways of designing structures, parking lots, drainage systems, and landscaping. This manual may be obtained at most cities' planning departments, or by contacting the San Francisco Estuary Project at (510) 622-2465." (California Regional Water Quality Control Board)

Comment G-26: "**Storm Water Quality Control.** Storm water is the major source of fresh water to creeks and waterways. Storm water quality is affected by a variety of land uses and the pollutants generated by these activities. Development and construction activities cause both site-specific and cumulative water quality impacts. Water quality degradation may occur during construction due to discharges of sediment, chemicals, and wastes to nearby storm drains or creeks. Water quality degradation may occur after construction is complete, due to discharges of

petroleum hydrocarbons, oil, grease, and metals from vehicles, pesticides and fertilizers from landscaping, and bacteria from pets and people. Runoff may be concentrated and storm water flow increased by newly developed impervious surfaces, which will mobilize and transport pollutants deposited on these surfaces to storm drains and creeks. Changes in runoff quantity or velocity may cause erosion or siltation in streams. Cumulatively, these discharges will increase pollutant loads in creeks and wetlands within the local watershed, and ultimately in San Francisco Bay.

To assist municipalities in the Bay Area with complying with an area-wide NPDES Municipal Storm Water Permit or to develop a Baseline Urban Runoff Program (if they are not yet a co-permittee with a Municipal Storm Water Permit), the Regional Board distributed the *Staff Recommendations for New and Redevelopment Control for Storm Water Programs* (Recommendations) in April 1994. The Recommendations describe the Regional Board's expectations of municipalities in protecting storm water quality from impacts due to new and redevelopment projects, including establishing policies and requirements to apply to development areas and projects; initiating appropriate planning, review, approval, and inspection procedures; and using best management practices (BMPs) during construction and post-construction.

Project impacts should be minimized by developing and implementing a Storm Water Pollution Prevention Plan (SWPPP). A SWPPP is required by the State Construction Storm Water General Permit (General Permit). The SWPPP should be consistent with the terms of the General Permit, the Manual of Standards of Erosion & Sedimentation Control Measures by the Association of Bay Area Governments (ABAG), policies and recommendations of the local urban runoff program (city and/or county), and the Recommendations of the RWQCB. SWPPPs should also be required for projects that may have impacts, but which are not required to obtain an NPDES permit. Preparation of a SWPPP should be a condition of development. Implementation of the SWPPP should be enforced during the construction period via appropriate options such as citations, stop work orders, or withholding occupancy permits.

Impacts identified should be avoided and minimized by developing and implementing the types of controls listed below. Explanations of the controls are available in the Regional Board's construction *Field Manual*, available from Friends of the San Francisco Estuary at (510) 286-0924, in BASMAA's *Start at the Source*, and in the *California Storm Water Best Management Practice Handbooks*." (California Regional Water Quality Control Board)

Response: Regarding cumulative development in the watershed and the impacts of cumulative projects on stormwater runoff, Draft EIR pages III-44 and III-45 and pages VI-2 through VI-8 describe foreseeable future development that could contribute to cumulative development. In the Peninsula Watershed, these projects include the Pulgas Dechlorination Facility, the Pulgas Balancing Reservoir Improvements, and the Lower Crystal Springs Dam Abutment Protection Project. In the Sunol Valley, the foreseeable future projects consist of the Sunol Valley WTP Improvement Project and the Alameda Creek Fishery Enhancement Project. In both watersheds, all of the projects would have zero to minimal increases in impervious surfaces and therefore would have no substantive effect on cumulative increases in stormwater volumes or velocity. In addition, the proposed project would be designed to minimize impervious surfaces at each site,

thereby minimizing long-term changes in stormwater patterns and flows. As shown in DEIR Table III-1 (see pages III-8 through III-10), the estimated maximum increase in impervious surfaces at all project locations would be less than once acre, which is a negligible increase within each of the various watersheds. Therefore, potential impacts associated with cumulative increases in stormwater due to the proposed project and to other planned projects are considered less than significant.

Comments G-22, G-23, G-25, and G-26 are directed towards management of comprehensive municipal stormwater systems in urban and suburban settings. The proposed project involves minor stormwater issues for relatively small water facilities. It does not involve redevelopment projects; development areas or projects; or areawide planning, review, approval, and inspection procedures, as referred to in the Comment G-26 discussion of the *Staff Recommendations for New and Redevelopment Control for Storm Water Programs.* There is no regulatory or impact-related indication that a SWPPP is required for this project, or that on-site capture of 80 to 90 percent of each site's annual estimated average runoff would be necessary. As described on DEIR pages IV.D-12 through IV.D-15, the proposed project would comply with RWQCB requirements for stormwater control during construction, as appropriate, including obtainment of and compliance with the General Permit (for sites greater than five acres) at the Pulgas site. For all other sites, the SFPUC would implement standard erosion and sediment control measures and other best management practices to protect surface water from potential stormwater impacts during construction (see also the response in Section II.G.9.0, Erosion Control, above).

14.0 GENERAL SUMMARY COMMENTS

Comment G-27: "Possible impacts: Without proper control and mitigation measures, the project could potentially result in:

- Discharge of chloraminated, chlorinated, or superchlorinated water to surface waters, resulting in the serious impairment of the habitat beneficial uses of such waters
- Discharge of concentrations of un-ionized ammonia that are sufficiently high to be toxic to fish
- Increased stormwater runoff that could result in onsite pollutants being carried to nearby surface waters, as well as increased erosion that could cause sedimentation of these waters.
- Construction may cause erosion, which could increase sediment loads in nearby surface waters, impairing water quality.
- Disturbance or destruction of wetlands" (California Regional Water Quality Control Board)

Comment G-28: "In order to prevent negative impacts to water quality, SFPUC proposes to implement the following measures:

- The project design would include an 'uninterruptible power supply', 'redundant design elements', 'site-specific emergency response plans', and would be constructed to 'withstand maximum probable earthquakes'. (IV.D-21)

- The total ammonia concentration in the SFPUC water supply would not exceed 0.50 mg/L. The DEIR concludes that under the anticipated range of temperature and pH conditions of the waters that might receive a discharge, the maximum concentration of un-ionized ammonia in discharge water would be 0.02 mg/L (less than the San Francisco Bay Basin Water Quality Control Plan's (Basin Plan's) 0.40 mg/L effluent limit).

- The project applicant assesses the impacts of increased runoff and the possibility of pollutant mobilization as not significant. No mitigation measures are proposed.

- The SFPUC intends to prepare a Stormwater Pollution Prevention Plan (SWPPP) for the Pulgas site, which would address erosion concerns for the construction period. All other sites would 'comply with standard SFPUC construction specifications for erosion and sediment control.'

- The project sites will be studied to delineate wetlands and attempts will be made to avoid impacting them wherever possible. If significant impacts cannot be avoided, the proponent will mitigate these losses pursuant to Army Corps of Engineers (Corps) and California Department of Fish and Game (CDFG) permits." (California Regional Water Quality Control Board)

Response: The commentor correctly summarizes water quality impacts and mitigation measures associated with the proposed project, as described in the Draft EIR. Implementation of project design features and mitigation measures included in DEIR Chapter V would reduce impacts to less than significant.

H. PUBLIC HEALTH

Comment H-1: "Chlorine and chloramine may have similar properties. Chlorine has a long history of use. Chloramine has a long history of use -- maybe not quite as long. In the scheme of things, though, chloramine introduction is a relatively new kind of entity. My concerns are not from a civil engineering standpoint or chemical engineering. They are from a medical science/safety standpoint. When you introduce something new into the environment that can affect people and life forms, you ask questions about what can happen short-term from a toxicology standpoint, what can happen long term, perform multi-generational studies. These are typically done in the laboratory, or you will conduct toxicology on animals -- that's what's required nowadays -- or you'll do breeding studies to see if progeny are affected by what you've done in unknown ways at low dosage. You don't know. So the questions would be, has there ever been a direct comparison of chlorine to chloramine in laboratory studies, for example, of animals. I saw one study when I did a little searching at the NIH, maybe about eight years ago, I guess, and they were looking at rats that had chloramine versus chlorine. It was only one study, and they concluded different things. One study doesn't make a story, in my mind, at all. So from that safety standpoint, I'm not -- a safety comparison of one versus the other -- I'm not challenging civil engineering or anything like that. I'm talking about safety aspects, those direct comparisons, side by side, should be done. I've experienced too many things like this. It's analogous, almost, to a pre-clinical that one does in developing a drug. This is not a drug, but it does affect millions of people. I'm speaking from the standpoint of being a citizen of the community, having family here. My son and his wife live here, my wife and I live here, and that's not as an engineer. I'm speaking in terms of safety." (Walter Goldstein, San Mateo Public Hearing)

Comment H-2: "Thank you for the copy of the subject report. As noted in past correspondence, attached for your convenience, safety in introduction of a new treatment chemical like this is most important. The report, page IV.E.-1-7, speaks of studies of byproducts formed in use of chlorine and chloramine and provides a reference to one study, AWWA, 1993 report. Optimizing Chloramine Treatment by Kirmeyer, et. al. Is that report available to be read as it seems to be the only reference on relative safety? Can a copy be provided?" (Walter E. Goldstein)

Comment H-3: "Changing the method of treating our water is extremely serious. Water is far from an inert substance. Adding chloramine versus chlorine causes a different reducing state for the water, which may directly affect organism growth and the response of mammalian cells and tissue to the fluid, which has been treated with this additive.

Therefore, what safety studies have been done to assure that this change will be healthy for humans and animals and not cause harmful effects over the short and long term?

What studies have been done in regard to side reactions and chemical by-products generated by contact of chloramine with other materials? This should be compared to chemical by-products generated due to contact of materials with chlorine.

What microbiological studies have been conducted to demonstrate adequacy of control of contamination comparing chloramine and chlorine treatment?" (Walter E. Goldstein)

Comment H-4: "It is most important that comparative biological safety studies have been conducted for reference. For example, there should be studies of the effects on microbes, including pathogens and non-pathogens. There should be evaluations of the effects on animals through toxicology, feeding, and multi-generation studies. These studies should then lead to prediction of potential effects on humans and other life forms. These subjects are mentioned. However, direct references on safety studies except for the single AWWA report noted are not provided. Perhaps these scientific studies have been completed. If so, I would like to be referred to them.

Certainly, when a relatively newer compound (chloramine) is introduced on a very large scale, and may substitute or partially replace another compound (chlorine) in use for a lengthier period, these questions are important. Sometimes a newer seemingly more beneficial entity is introduced and problems result that can be devastating. I think the biological/medical science side of this project should receive more attention than is apparent in areas noted." (Walter E. Goldstein)

Comment H-5: "The second item is, chlorine is a strong oxidizing agent. It works by absorbing hydrogen from entities and destroying them that way. Chloramine may have a similar function. I guess my question would be, have there been studies on the effects of the microbes, in terms of one agent versus the other directly, in terms of pathogens and things that are not pathogens which are beneficial, which forms -- were resistant forms created? I'm not advocating that we cease using chlorine or even chloramine. Obviously, we don't want to bring on disease. I'm advocating examination of a newer entity versus another one, a direct comparison, so we know scientifically if we can control microbiology the way we want to, and then we will do no harm to the environment or the health of the people or the life forms. That's my point, and thank you." (Walter Goldstein, San Mateo Public Hearing)

Response: While the proposed project would introduce a new method of disinfection to the SFPUC drinking water system, use of chloramine for disinfection is an established, proven technology and fully protective of public health and safety when used appropriately. Both the U.S. Environmental Protection Agency and the California Department of Health Services have recognized and adopted chloramine as an accepted method of disinfection, particularly for secondary disinfection, due to its ability to reduce the level of disinfection by-products.

Chloramine has been used in the United States for the treatment of drinking water since the early 1900s. Chloramine has been proven to be effective for disinfection, control of taste and odor, oxidation of organic and inorganic materials, and suppression of biological growth within drinking water treatment systems. Historically, chloramine use for water supply disinfection was common in the 1930s, but due to the scarcity of ammonia (a key component needed for the formation of chloramine) during World War II, most utilities converted to chlorine during and following the war. Therefore, chloramine use was not widespread during the 1950s and 1960s. More recently, chloramine use has become more common, due to the need to control the formation of disinfection by-products. In 1990, about one-fourth of the treatment facilities in the

U.S. were using chloramine for disinfection. With the recent adoption of the Disinfectants and Disinfection By-Products Rule, the use of chloramine is expected to become even more widespread. As described on Draft EIR page II-2, chloramine is currently being used for disinfection at numerous Bay Area utilities, including East Bay Municipal Utility District, Alameda County Water District, Santa Clara Valley Water District, Contra Costa Water District, and Marin Municipal Water District.

For information regarding chloramine health effects, toxicology, and animal and other studies, the commentor is referred to the following:

Bull R. J., and R. C. Kopfler. 1991. *Health Effects of Disinfectants and Disinfection By-Products.* Denver, Colo.: American Water Works Association Research Foundation and American Water Works Association. Access available through AWWARF website at <www.awwarf.com>

Kirmeyer, Gregory J., Glenn Foust, Gregory Pierson, Joseph Simmier, and Mark LeChevallier. 1993. *Optimizing Chloramine Treatment.* Denver, Colo.: American Water Works Association Research Foundation and American Water Works Association. Access available through AWWARF website at <www.awwarf.com>

U.S. Environmental Protection Agency. 1992, revised 1994. *Integrated Risk Information System (IRIS) Substance File – Monochloramine; CASRN 10599-90-3.* Access available through <www.epa.gov/ngispgm3/iris/subst/0644>

I. AESTHETICS

Comment I-1: "**Aesthetics.** The dechloramination facility requires construction of an industrial building in an undeveloped setting. The simulation on Page IV.F-12 shows a substantial impact to the view from scenic Cañada Road into the SF Watershed. The simulation does not show any of the architectural elements that are identified in the mitigation measures, such as a decorative gate or slanted roof. In addition to consultation with the Land and Resources Management Section, a professional architect should be consulted to design architectural elements that fit into the existing viewshed." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Comment I-2: "Aesthetics Impacts- The proposed 20,000 square foot facility (30 feet tall) would be massive in comparison to any adjacent building or structure and would result in significant aesthetic impacts, especially given the recreational use and scenic nature of the project site. The project includes several mitigation measures and concludes that they would reduce the impact to a less than significant level. The measures identified (a sloped roof and exclusion of reflective materials for the building) are not enough to determine that the building would not have a significant impact. Additional information such as the materials and colors that are proposed for the building should be included." (City of San Mateo)

Comment I-3: "A berm to screen the building from Cañada Road is also proposed. No information is given regarding the height, location, etc., of the proposed berm. The inclusion of high berm would add an artificial feature along this roadway and would not entirely screen views of the building from the roadway or from the Pulgas Water Temple. This would have to be achieved with additional landscaping. Photo simulations with the proposed mitigation should be included in the document to assess this impact.

Given the sensitive nature of the site and the height of the building, consideration should be given to berming and landscaping directly around the building. This would create a more natural topography and would recess the building, helping to screen the building more effectively. The measures identified are not adequate to conclude that the project would not result in significant aesthetic impacts." (City of San Mateo)

Response: The EIR recognizes that the placement of the proposed Pulgas dechloramination facility building south of the Pulgas Water Temple would be a potentially significant impact, as it would introduce a sizable structure in a relatively undeveloped, scenic area. The mitigation measures suggested in the DEIR (pages V-12 and V-13) are deemed adequate to reduce the impact to a less than significant level, based on the following considerations.

First, the site proposed for the facility is not used for recreational purposes; in fact, no public access is permitted in the area of the proposed facility site. As stated in the DEIR (page IV.F-2), the site is not visible from the Pulgas Water Temple area, which is the recreational focus of the area. As also noted on DEIR page IV.F-2, and as shown in Figure IV.F-6 (page IV.F-13), the facility site is screened from the Pulgas Water Temple parking lot by dense vegetation, and

Figure IV.F-7 (page IV.F-14) indicates that the facility would be barely discernible from the parking lot.

Second, although a generally aesthetically pleasing area, the site and vicinity are not pristine environments. Aside from Cañada Road itself, existing views include a chainlink fence and "No Parking" signs along the road.

Third, close- and medium-range views of the proposed facility would not be available from any public area where people gather or linger. Views of the facility would primarily be seen from passing automobiles and bicycles travelling on Cañada Road. Thus, the perspectives illustrated in DEIR Figures IV.F-3 and IV.F-5 would be seen at high speed (relative to walking). Therefore, the overall aesthetic experience of traveling along Cañada Road would be only slightly, not substantially, diminished.

Fourth, the visual simulations in the EIR represent a worst-case scenario because they (a) assume maximum building size and tree removal, which could be less than shown; (b) leave out any architectural design, color treatment, or security gate that would minimize the appearance of the facility, although such design and treatment is planned as part of the project; and (c) leave out any landscaping that would screen the facility from the road, although extensive landscaping is planned as part of the project. The EIR simulations made these assumptions because the facility's architecture, color/materials, and landscaping scheme are only preliminary at this time, and any particular depiction could be misleading and subject to change. Color can be rendered in a way that makes a building almost invisible in a photosimulation, but the color would appear different when actually constructed and viewed. The facility would require a security gate across the access driveway which would further screen views of the facility from the road, but gate size and design have not yet been developed. Landscaping can be shown fully mature but would actually take years before such height and density could be achieved.

The project's sensitive architectural treatment, careful site planning to minimize the building size and the number of trees removed, and implementation of a revegetation plan would all serve to screen and soften the visual impact of the building. Over time, as landscaping matures, the building would be less and less visible from Cañada Road. Figures 1 and 2 of this Comments and Responses document show visual simulations with possible landscaping added (but still without architecture or color treatments).

An independent architectural firm provided the preliminary architectural designs for the project facilities that were used for the DEIR evaluation. The final design of project facilities would also be completed by professional architects, as required by standard SFPUC procedures, and would incorporate the above-described considerations for architectural treatments. Design of project landscaping would be completed by professional landscape architects, as required by standard SFPUC procedures.

SOURCE: Michael Willis Associates, 2000

Note: Details shown area for scale only

See Figure IV.F-1 for viewshed location
See Figure IV.F-2 for existing photo

1998.898E: Hetch Hetchy Water Treatment Chloramine Conversion Project EIR / 990095

Figure 1
Block Diagram of Pulgas Dechloramination Facility with Possible Landscaping, from Cañada Road, View 1

SOURCE: Michael Willis Associates, 2000

See Figure IV.F-1 for viewshed location
See Figure IV.F-4 for existing photo

Note: Details shown are for scale only.
Architectural treatment and security gate not shown.

1998.898E: Hetch Hetchy Water Treatment Chloramine Conversion Project EIR / 990095

Figure 2
Block Diagram of Pulgas Dechloramination Facility with Possible Landscaping, from Cañada Road, View 2

Regarding the berms proposed as mitigation, Mitigation Measures F-1 and F-6 both call for a combination of berms and landscaping to screen the building from Cañada Road. The intention is that berms would blend into the landscape contour to appear natural, in combination with landscaping consistent with existing vegetation. To clarify this intention, Draft EIR page V-13, Mitigation Measure F-6 has been revised:

F-6 The access road shall be designed to minimize both the removal of existing native plants and the number of new plantings needed to provide screening. The entry road shall be curved, and ~~a~~**natural-appearing** berms shall be **graded in appropriate locations that**~~installed along the road to~~ screen views of the facility from Cañada Road. New plantings shall be placed on top of the berm to eventually screen views of the proposed building.

While aesthetic judgements among people can differ, the mitigation measures included in the EIR, as clarified above, are considered adequate for the project to avoid substantially degrading or obstructing scenic views from public areas or creating substantially negative aesthetic effects.

Comment I-4: "The mitigation measures for the aesthetics do not identify methods or reduce light and glare from lighting systems. Mitigation measures should be included to minimize nighttime lighting to reduce impacts to wildlife and to reduce the overall fugitive light, degrading the visibility of the dark night sky." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: As discussed on DEIR page IV.F-15, exterior security lighting at the proposed dechloramination facility would be evident in views from Cañada Road and the Pulgas Water Temple parking lot. However, this lighting would not affect nighttime views from residential areas. The project would increase the amount of light and glare visible from Cañada Road, but this would be a less than significant impact, since no recreational use of the area occurs after dark. While not required to mitigate a significant impact, it is recommended that lighting be directed downward and that the lighting installed be the minimum necessary for security and operations. Safety lighting should be provided at the entry gate, the access road, and the parking area. Energy-efficient, low-wattage light fixtures should be used. SFPUC should consider using light fixtures with timers or separate switches to minimize lighting effects. The recommendations to minimize potential glare are included as Improvement Measure N-6 on page V-20 of the DEIR.

J. CULTURAL RESOURCES

Comment J-1: "**Cultural Resources.** Mitigation Measure G-1 should be strengthened to include an archaeologist on-site during ground disturbing activities at the Pulgas site. The EIR states the 'One prehistoric archaeological site CA-Sma-147, located approximately 800 feet south of the Pulgas Water Temple (Page IV.G-3).' Given the proximity of a recorded archaeological site, approximately 200 to 300 feet from the proposed dechloramination facility, it would appear prudent to retain an archaeologist during the soil excavation." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: The EIR has been revised to include an increased level of mitigation at the Pulgas site for potential impacts to archaeological resources during construction. The following text changes have been made to the section entitled "Construction Impacts to Archaeological Resources," on Draft EIR page V-14.

Construction Impacts to Archaeological Resources

The following measure addresses potential impacts to cultural resources associated with project construction at the Tesla Portal, San Antonio Pump Station, Alameda East and West Portals, Pulgas, and Harry W. Tracy sites:

G-1 In the event of an inadvertent discovery of a cultural resource during construction **at the Tesla Portal, San Antonio Pump Station, Alameda East and West Portals, and Harry W. Tracy sites**, work within 25 feet of the find shall be stopped and a professional archaeologist shall be contacted to evaluate cultural resources and to determine appropriate treatment. The contractor shall comply with the recommendations of the archaeologist before resuming construction.

Given the location and depth of excavation proposed at the Pulgas site and the likelihood that archaeological resources would be encountered, the sponsor shall retain the services of an archaeologist. The archaeologist shall carry out a pre-excavation testing program to better determine the probability of finding cultural and historical remains. The testing program would use a series of mechanical, exploratory borings or trenches, and/or other testing methods determined by the archaeologist to be appropriate. The testing shall be terminated if the archaeologist determines, from subsurface inspections, that the area has been filled or disturbed during prior work.

If, after testing, the archaeologist determines that no further investigations or precautions are necessary to safeguard potentially significant archaeological resources, the archaeologist shall submit a written report to the Environmental Review Officer (ERO), with a copy to the project sponsor. If the archaeologist determines that further investigations or precautions are necessary, he/she shall consult with the ERO, and they

shall jointly determine what additional procedures are necessary to minimize potential effects on archaeological resources.

These additional procedures would be implemented by the project sponsor and could include a program of on-site monitoring of all site excavation, during which the archaeologist would record observations in a permanent log. The monitoring program, whether or not there are finds of significance, would result in a written report to be submitted first and directly to the ERO, with a copy to the project sponsor. During the monitoring program, the project sponsor would designate one individual as his/her on-site representative. This representative would have the authority to suspend work at the site to give the archaeologist time to investigate and evaluate archaeological resources, should they be encountered.

Should evidence of cultural resources of potential significance be found during the monitoring program, the archaeologist shall immediately notify the ERO, and the project sponsor shall halt any activities that the archaeologist and ERO jointly determine could damage such cultural resources. Ground-disturbing activities that might damage cultural resources would be suspended for a total maximum of four weeks over the course of construction.

After notifying the ERO, the archaeologist would prepare a written report to be submitted first and directly to the ERO, with a copy to the project sponsor, which would contain an assessment of the potential significance of the find and recommendations for what measures should be implemented to minimize potential effects on archaeological resources. Based on this report, the ERO would recommend specific additional mitigation measures to be implemented by the project sponsor. These additional mitigation measures could include a site security program, additional on-site investigations by the archaeologist, and/or documentation, preservation, and recovery of cultural material.

Finally, the archaeologist would prepare a report that documents the cultural resources discovered, evaluates their significance, and describes how any archaeological testing, exploration, and/or recovery program was conducted.

Copies of all draft reports prepared according to this mitigation measure would be sent first and directly to the ERO for review. Following approval by the ERO, copies of the final report(s) would be sent by the archaeologist directly to the President of the Landmarks Preservation Advisory Board and the California Historical Resources Information System, Northwest Information Center, Sonoma State University, Rohnert

Park. Three copies of the final archaeology report(s) shall be submitted to the Office of Environmental Review, accompanied by copies of the transmittals documenting its distribution to the President of the Landmarks Preservation Advisory Board and the California Historical Resources Information System, Northwest Information Center, Sonoma State University, Rohnert Park.

Implementation of Mitigation Measure G-1 would reduce potential construction impacts to archaeological resources to a less than significant level.

Comment J-2: "In addition, consulting with the Ohlone tribes on potential prehistoric finds is an important element for the project to ensure minimal delay if excavation unearths a burial site. The GGNRA can provide assistance in identifying and contacting appropriate individuals." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: As described above in the response to Comment J-1, the mitigation measure for potential archaeological impacts at the Pulgas site during construction has been revised to provide a higher degree of protection for potential resources. The exposure of any burial sites during construction would be handled in accordance with state law.

K. GEOLOGY

Comment K-1: "Page IV.H-7, In the Calaveras Fault section, the second sentence is unclear." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: In response to this comment, DEIR page IV.H-7, paragraph 3 has been revised:

The Calaveras Fault

The Calaveras fault is a right-lateral strike-slip fault associated with the San Andreas fault system. It is one of the largest **faults** in California~~ and has a vertical component responsible for the upward movement of the west side of the fault~~. The relative amount of horizontal movement is not exactly known, but has been estimated to be between 3 to 13 miles. Because the prevailing dip of the fault is almost vertical or to the west, the vertical component of the fault movement is reversed **and is responsible for the upward movement of the west side of the fault**. At least three major earthquakes have occurred along this fault since 1800, including the following:

- 1984 earthquake centered about 16 miles east of Watsonville at Coyote Dam with a Richter magnitude of 6.2
- 1911 earthquake centered east of San Jose with a Richter magnitude of 6.6
- 1861 earthquake believed to have been centered near Dublin and San Ramon, with an estimated Richter magnitude of about 6.4

The fault crosses the Hetch Hetchy Aqueduct at Calaveras Road on the east flank of the Sunol Valley. A western splay of the fault, sometimes referred to as the Sinbad fault, has been mapped on the west side of the valley, but trenching studies conducted for this project (SFWT, 1995) and by others have failed to yield evidence of Holocene or older activity of this splay (AGS, 1999). The estimated slip rate of the Calaveras fault is reported to be 6.0 ± 2.0 mm/yr. A characteristic earthquake on this fault would be expected to have a moment magnitude of 6.8 and a recurrence interval of 146 years (Simpson et al., 1994).

Comment K-2: "Page IV.H-17, paragraph 2, has a typing error, the EIR should read 'within an Alquist-Priolo Earthquake Fault Zone' not "with an Alquist-Priolo Earthquake Fault Zone.' " (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: In response to this comment, DEIR page IV.H-17, paragraph 2 has been revised:

> **Harry W. Tracy WTP.** Based on the geotechnical investigation conducted at this site in 1990 (AGS, 1990), it was determined that the WTP is located with**in** an Alquist-Priolo Earthquake Fault Zone. However, the evidence suggests that this extension of the San Andreas fault, the Serra fault, is not active. Therefore, the potential for seismic ground rupture would be considered less than significant.

L. HAZARDOUS MATERIALS

Comment L-1: "**Hazardous Materials.** The proposed project will make the Pulgas dechloramination facility a significant storage and handling facility for a large quantity of chemicals. The building will store up to approximately 90,000 gallons of chemicals. In addition, hazardous materials will be transferred through underground pipelines adjacent to drinking water. Currently there are no chemicals at the Pulgas site and no mitigation measures are identified for hazardous materials. It is imperative that the emergency plans and worker training requirements in the EIR be implemented to the fullest degree." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: As stated on DEIR page IV.I-19, a hazardous materials business plan would be prepared for the proposed dechloramination facility at the Pulgas site. The plan would include employee training requirements and site-specific emergency procedures to be followed in the event of a chemical release. General SFPUC emergency procedures and employee training requirements are described on DEIR pages IV.I-14 and IV.I-15. Pulgas dechloramination facility personnel would be trained to adhere to SFPUC policies and procedures and to the requirements of the hazardous materials business plan.

M. TRANSPORTATION

Comment M-1: "**Transportation.** The discussion of transportation does not include the potential for traffic disruption from spills or accidents involving trucks delivering chemicals to the dechloramination facility. According to the table on page IV.I5-6, there is a possibility of 4 to 26 deliveries of chemicals every two weeks, or possibly 104 to 676 deliveries per year. This is a significant change from the current no deliveries and should be addressed in the EIR." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: The commenter overestimates the potential number of chemical deliveries that would occur annually at the Pulgas site by including the maximum number of deliveries on a weekly basis for an entire year. The maximum number of weekly deliveries would not be required for every week of any given year, and the actual range of annual deliveries would be much lower than the upper end of the range stated in Comment M-1.

Traffic and safety impacts associated with the projected operational chemical deliveries are discussed on DEIR pages IV.J-9 and IV.J-10. As noted on DEIR page IV.J-9, operation of the proposed project would generate two to five chemical deliveries per week under average flow conditions, and 12 to 14 deliveries under maximum flows (which occur three to four months out of the year, typically during summer months). Such delivery rates would generate an average of one off-site truck round-trip per day under average flow conditions, and up to three off-site truck round-trips per day under maximum flows. It is estimated that a maximum of less than 415 chemical deliveries would be generated per year at the Pulgas site.

Such increases in traffic relative to background traffic volumes are small and are not expected to significantly increase the potential for accidents in the study area; therefore, these increases would not result in significant traffic disruption from spills or accidents. The SFPUC would schedule chemical deliveries to occur on Monday through Saturday only (except in emergency situations), thereby avoiding potential conflicts with the Bike Sunday program. Improvement measures described in Section V.N of the Draft EIR to coordinate with San Mateo County for potential emergency chemical deliveries that occur on Sundays would further reduce potential conflicts with recreational traffic.

N. AIR QUALITY, UTILITIES, AND SERVICES

Comment N-1: "1. The California Integrated Waste Management Act of 1989 (AB 939) requires each jurisdiction to divert at least 50 percent of solid waste from landfills by the year 2000. Construction and demolition debris constitute a major portion of the disposed materials at a landfill. Neither the Initial Study nor the Draft EIR discuss solid waste disposal of the construction and demolition debris that will be generated from the construction activities on each site and what programs will be proposed to divert the disposal at any landfill in order to meet the spirit of AB 939." (County of San Mateo)

Response: The proposed project would generate minimal construction debris. The only demolition activity proposed would be one outbuilding at the Tesla site, which would generate less than 50 cubic yards of demolition material. At all other project sites, proposed construction would occur on currently vacant, unpaved land, and there would be minimal roadway asphalt removal, if any, or construction debris requiring disposal at a landfill. Therefore, potential solid waste impacts to regional landfill capacity would be less than significant and no mitigation is required.

Comment N-2: "**Air Quality and Utilities and Public Services.** Air Quality and Utilities and Public Services are not analyzed in Chapter 4 (Environmental Setting and Impacts), and yet there are mitigation measures for each in Chapter 5. The EIR does not describe the immediate or regional setting, provide schematics to evaluate potential impacts, or discuss local air quality district requirements. CEQA states a draft EIR 'must include a description of the environment in the vicinity of the project, as it exists before the commencement of the project, from both a local and a regional perspective.' (CEQA Guidelines § 15125)

The final EIR should include a discussion of both resource areas." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: As stated on Draft EIR pages V-18 through V-19, the mitigation measures presented in the EIR for Air Quality and for Utilities and Public Services refer to the analyses conducted in the Initial Study, which is included as DEIR Appendix A. The commentor is referred to Appendix A for the assessment of Air Quality and Utilities and Public Services impacts. Chapter V of the DEIR provides a consolidated list of all mitigation measures identified for the proposed project.

O. MITIGATION MEASURES

Comment O-1: "**Mitigation Measures.** The purpose of the 'Mitigation Measures Identified in this Report' is unclear. The measures 'are not included in the project, but could reasonably be expected to reduce the adverse impacts of the project if required as conditions of approving the project (page V-1).' Please clarify the nature of these mitigation measures. The minimum commitment of mitigation measures in the EIR is 18 of the 55 identified. The criteria for selection and the decision-makers should be identified and the EIR should discuss the benefits and disadvantages of choosing one mitigation measure over another." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: California Environmental Quality Act (CEQA) Guidelines Section 15126.4 requires that an EIR describe feasible measures that could minimize significant adverse impacts. Further, the EIR must distinguish between measures proposed by the project proponents to be included in the project and those measures proposed by the lead, responsible, or trustee agency, which are not included but could reasonably be expected to reduce the adverse impacts if required as conditions of approving the project (listed in the DEIR as "Measures Identified in this Report"). Mitigation measures identified in the EIR are available for the SFPUC to adopt, but the EIR does not determine which measures are to be adopted. If the project is approved by the SFPUC, the SFPUC would, at the time of project approval, adopt CEQA findings that make the determination as to whether to adopt mitigation measures identified in the EIR and implement the measures as conditions of approval for the project. Mitigation measures can be rejected if specific findings of infeasibility are made. In such a case, a statement of overriding considerations, finding that the benefits of the proposed project outweigh the unavoidable adverse environmental effects, would be required.

P. ALTERNATIVES

Comment P-1: "A draft EIR must describe a range of reasonable alternatives to the proposed project, or to its location, that could feasibly attain the project's basic objectives, and must evaluate the comparative merits of each alternative. The discussion must focus on alternatives capable of either eliminating any significant adverse environmental effects or reducing them to a level of insignificance, even if such alternatives would be more costly or would impede to some degree the project's objectives. If the lead agency prefers the project alternatives, the EIR must explain why the agency chooses to reject other alternatives, if considered in developing the proposal. If an agency finds certain alternatives to be infeasible, its analysis must explain in meaningful detail the reasons and facts supporting that conclusion.

Page VII-1 states that Chapter VII will discuss 'Facility Siting and Design Alternatives.' Although there is a discussion of facility siting, the chapter does not present design alternatives for the Pulgas dechloramination facility. There is not an analysis of reducing the square footage requirements of the dechloramination building, associated piping, or contactor basin. There is not an analysis of constructing the decloramination building below grade to reduce the visual impacts." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Comment P-2: "**Alternatives-Pulgas Site.** Serious consideration should be given to locating the dechloramination facility in a less sensitive area, avoiding the wetland, riparian habitat, and special status species impacts. The discussion of Other Facility Siting Alternatives Considered (Section VII-E.3.0) dismisses the site east of Cañada Rd on the basis of recreation and potential cost considerations. However, moving the site to the east could keep it out of the scenic corridor and the fault zone. The engineering analysis used for site selection should be presented in more detail." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Comment P-3: "Address the possibility of colocating the pipelines where they cross the unnamed drainage to reduce impacts to sensitive species." (United States Department of the Interior, National Park Service, Golden Gate National Recreation Area)

Response: Draft EIR Chapter VII presents a discussion and assessment of a reasonable range of alternatives to the proposed project that would feasibly attain most of the basic objectives of the project. Due to the strict regulatory requirements stipulated by the Stage 1 Disinfectants and Disinfection By-Products Rule and the geographic restrictions based on the location of existing facilities, there was a limited range of reasonable alternatives that could meet the project objectives. A number of alternatives and subalternatives were eliminated from further consideration because they would either not achieve the project objective or would result in greater environmental effects than the proposed project.

At the Pulgas site, the alternative location for the dechloramination facility east of Cañada Road would not achieve the project objective of improving the reliability of the water supply system. Due to topographic constraints, any facility at this location would require pumping water both to

and from the dechloramination facility. Pumping would reduce the reliability and efficiency by increasing the complexity of the system, so this alternative site location was eliminated from further consideration. In a pumped system, pump failure (due to mechanical problems, power outages, etc.) would not allow chloraminated flow to be diverted to the dechloramination facility for treatment, thus resulting in the discharge of chloraminated water to Crystal Springs Reservoir. The proposed project is a gravity system, which would provide for greater system reliability and therefore greater environmental protection.

Also at the Pulgas site, the suggestion to co-locate the two pipelines to and from the dechloramination facility in the same trench across the drainage channel instead of in two trenches would result in greater environmental effects than the project as proposed. If the two pipelines were located in one trench, it would require a wider and deeper trench across the drainage channel. With two trenches, it is proposed that the outflow pipeline be located in the existing gravel road to reduce impacts to the drainage channel and associated vegetation, and only the inflow pipeline would cross the drainage channel. Therefore, this option to co-locate the two pipelines in the same trench was eliminated from further consideration.

With mitigation measures identified in the EIR, implementation of the project would not result in unavoidable adverse impacts. Because the primary purpose of alternatives identification and analysis is to avoid or reduce a project's significant impacts, the EIR's discussion of alternatives is considered adequate and appropriate.

Q. GENERAL

Comment Q-1: "City of Sunnyvale staff reviewed the report for potential impacts on our water and wastewater systems. Based on the information presented in the Draft EIR, we do not have any specific comments on the project at this time." (City of Sunnyvale)

Comment Q-2: "Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above referenced project. We have examined the DEIR and are satisfied with the document." (Department of Transportation)

Response: These comments are noted.

CHAPTER III

STAFF-INITIATED TEXT CHANGES

The following corrections and/or clarifications have been made to the EIR text, in addition to those changes listed in Chapter II of this document. These corrections include: minor corrections made by the EIR authors to improve clarity, grammar, and consistency; or staff-initiated text changes to update information presented in the DEIR. The text revisions are organized by the chapter and page number that appear in the DEIR. Deleted text, shown as "~~deleted text~~," presented in this section indicates text that has been deleted from the EIR. Text that has been added to this EIR is presented as **bold**.

DEIR pages IV.C-19 through IV.C-21, section entitled "Pulgas Site":

> ***Pulgas Site***
>
> **The description of special-status species in the Pulgas site area encompasses the dechloramination facility and contactor basin area, the contactor pipeline routes leading to the dechloramination facility and from the contractor basin, and areas to the west and northwest of project facilities (see Figure IV.C-1).**
>
> Most of the special-status plants considered in Appendix C (e.g., Marin dwarf flax [*Hesperolinon congestum*] and San Mateo thorn-mint [*Acanthomintha duttonii*]) that occur within the Peninsula Watershed require certain habitat conditions **that are not present at the Pulgas site**, such as serpentine soils, areas of low disturbance, or the presence of other plant species. Other species (e.g., San Francisco wallflower [*Erysimum franciscanum*] and Dudley's lousewort [*Pedicularia dudleyi*]) favor areas subject to disturbance events such as burns or mowing. Disking and other routine maintenance activities at the Pulgas site have caused disturbance that exceeds the requirements of species such as San Francisco wallflower and Dudley's lousewort. For this reason, no special-status plants are likely to occur at this site.
>
> **Many nesting passerine bird species (protected by the Migratory Bird Treaty Act) and possibly nesting raptors (protected by the Migratory Bird Treaty Act and CDFG Code 3503.5) are expected at the Pulgas site during the nesting season (approximately March 1 through August 15).**
>
> **Special-status species are described below for the following locations: the proposed dechloramination facility and contactor basin site, the contactor pipeline routes, and adjacent areas. No other potential special-status wildlife species were identified for the Pulgas site.**

Pulgas Dechloramination Facility and Contactor Basin. ~~The Pulgas site~~**This area** consists of annual grasslands, with woodland habitat located to the north and east. The grasslands in this area contain few small mammal burrows (only pocket gopher burrows were noted) and little plant or wildlife diversity. No debris, snags, woodpiles, rockpiles, slash, or other types of cover were observed on this site. Based on these findings, the grasslands portion of the ~~site~~**Pulgas dechloramination facility and contactor basin area** does not appear to provide suitable habitat for San Francisco garter snake (*Thamnophis sirtalis tetrataenia*) or California red-legged frog (*Rana aurora draytonii*),~~–~~ **the primary species of concern in the project region, although such a determination must be made with caution considering the known presence of the species in the area.**

Contactor Pipeline Routes. The proposed pipeline route between the Pulgas Water Temple and the proposed **dechloramination** facility site would cross an unnamed drainage that does provide potential San Francisco garter snake and California red-legged frog habitat **(see Figure IV.C-1)**. A 4-foot by 3-foot pool suitable for California red-legged frog breeding was observed downstream from the proposed crossing area. It is anticipated that the associated oak woodland riparian habitat in this waterway could provide upland refugia for this species as well. The presence of aquatic habitat and suitable forage species suggests possible habitat for San Francisco garter snake, but habitat for this species is considered marginal compared with downstream areas because of the narrow width of the riparian corridor.

Protected nesting birds, including several raptor species (e.g., northern harrier and red-tailed hawk), are expected to use the riparian woodlands north of the site during the breeding season.

The area surrounding the Pulgas ~~site~~**Water Temple** consists of ornamental plants and is regularly maintained. None of the special-status plant species considered in Appendix C are expected in this area. The location of proposed **pipeline** construction at the Pulgas ~~site~~**Water Temple** includes both disturbed and landscaped areas, as well as upland wooded habitat **to the south of the temple**. The Pulgas ~~site~~**Water Temple area** does not provide year-around habitat for the federal and state endangered San Francisco garter snake or the federal threatened California red-legged frog, the primary species of concern in the project region, although such a determination must be made with caution considering the known presence of the species in the area.

Adjacent Areas. Known breeding habitat for the California red-legged frog occurs ~~within 1,000 feet of~~**at Laguna Creek, which is located west of the Pulgas site area** ~~the southwestern site boundary~~, and potential upland refugia habitat occurs throughout the **Pulgas site** area (ESA, 1999). Potential upland aestivation habitat and basking areas for San Francisco garter snake occur in the marshy willow riparian habitats southwest of the overflow channel~~ on the project site~~. The willow thickets have a nearly impenetrable shrub layer consisting of poison oak and California

blackberry. The ground in the willow thicket appears to be persistently moist, though standing water was not observed during the fall site visits.

In November 1998, ESA biologists observed a mature California red-legged frog 200-300 feet from Laguna Creek on the south side of the access road. Laguna Creek is a minor tributary drainage to Upper Crystal Springs Reservoir. The mature individual was in upland habitat, under a madrone shrub. A California red-sided garter snake, a subspecies of the common garter snake with similar habitat requirements as the San Francisco garter snake, was observed roughly 150 feet southwest of the overflow channel. This species was detected in a small opening in the willow canopy that allowed for basking. Though habitat has been poorly described for the San Francisco garter snake, based upon the described propensity of the snake and California red-legged frog to use adjacent upland habitats (USFWS, 1985; 1996; Jennings and Hayes, 1994), all identified willow riparian habitats in the Pulgas site **area** region are considered to meet habitat suitability standards for California red-legged frog and San Francisco garter snake.

Upland habitat value for San Francisco garter snake and California red-legged frog depends principally upon the proximity to seasonal or perennial aquatic habitats; the availability of cover such as dense vegetation, leaf litter, or slash piles; and the availability of suitable food sources. Suitable habitat in the project area may include willow riparian habitat, grasslands, and wooded areas. Moderate- to high-quality upland habitat for San Francisco garter snake and California red-legged frog was identified in uplands and willow riparian habitats near the Pulgas site. Potential habitat was noted both south and west of the overflow channel~~ work area~~. ~~The habitat starts near the westernmost 200 feet of channel, roughly 40 feet to the south.~~ The identified willow riparian thicket becomes more dense further to the south and was also noted west of the overflow channel~~ work area~~. Grasslands adjacent to the willows may also provide habitat for San Francisco garter snake and California red-legged frog. Based upon the little known upland distribution preferences of San Francisco garter snake (USFWS, 1985) and close proximity of this ~~site~~**area** to essential breeding habitat, the mixed oak woodlands habitat ~~located southwest of the Pulgas Water Temple~~**along the contactor pipeline routes** should be considered at least marginally suitable for this species. While observed near the site, the California red-legged frog is not expected to use the annual grassland portion of the Pulgas ~~site~~**dechloramination facility, contactor basin, and contactor pipeline areas** because of the generally poor cover ~~this~~**these** areas provide~~s~~, but is presumed to be present seasonally in all other areas.

The willow riparian habitat also provides potential breeding habitat for the saltmarsh common yellowthroat, a federal and state species of concern. Breeding yellowthroat populations were identified in willow habitats near Upper Crystal Springs Reservoir within 600 feet of the proposed overflow channel area (CNDDB, 1999); however, willow thickets also occur within 50 feet of the proposed channel~~ work area~~.

~~Many nesting passerine bird species (protected by the Migratory Bird Treaty Act) and possibly nesting raptors (protected by the Migratory Bird Treaty Act and CDFG Code 3503.5) are expected at the Pulgas site during the nesting season (approximately March 1 through August 15).~~

~~No other potential special-status wildlife species were identified for the Pulgas site.~~

DEIR page IV.C-25, paragraph 2:

An unnamed creek occurs on the northwestern perimeter of this site (**see Figure IV.C-1**). Arroyo willow is the dominant species along the creek. Water was observed within the creek during ESA's September visit. Within the project site, the creek riparian corridor is approximately 400 feet long and 100 feet wide. The area of disturbance would be approximately 50 feet by 10 feet of Corps jurisdictional waters. This creek is subject to Corps jurisdiction under Section 404 of the Clean Water Act and CDFG regulations.

DEIR page IV.C-32, paragraph 4:

Vegetation Community Impacts

The CDFG has jurisdiction over vegetation removal within significant plant communities, such as willow riparian habitat. Thus, the removal of willow riparian vegetation at the Pulgas site would be subject to CDFG regulation. The approximate acreage of willow riparian habitat types is 500 square feet of combined coast live oak woodland and willow riparian habitat (**see Figure IV.C-1**). The removal of willow riparian habitat constitutes a substantial, adverse change in the physical conditions within the project area (CEQA Section 15382) and therefore would be considered a significant impact. However, mitigation measures listed in Section V.C to provide replacement habitat and to implement a revegetation plan would reduce the impact to less than significant.

DEIR page IV.D-16, paragraph 2:

To determine if the proposed project would result in ammonia toxicity in surface waters, a worst-case condition was analyzed to calculate the concentration of un-ionized ammonia that could be discharged to surface waters. The proposed project is designed such that the maximum concentration of total ammonia in the SFPUC water supply would be 0.50 mg/L (SFPUC, 1999). At **Upper** Crystal Springs Reservoir, the pH ranges from about ~~7~~**6**.5 to 8.**5**~~0~~, and the temperature ranges from about 10° C (degrees Celsius) to 2**4**~~0~~° C; under these conditions, the maximum concentration of the toxic form of ammonia in the chloraminated water would be approximately 0.07~~2~~ mg/L, well below the Basin Plan objective of 0.40 mg/L that applies to the receiving waters in the project area. The pH of the discharge would be maintained at a level less than 8.0 as part of the dechloramination process, which would also

maintain the ammonia in the discharge below toxic levels. Even with a pH level of 9.0 in the discharge water, the maximum level of un-ionized ammonia would be 0.14 mg/L as N (at 20°C) and would still be below the toxic level for receiving water. Under normal operating conditions, total ammonia levels would be reduced below 0.50 mg/L in the dechloramination process, and un-ionized ammonia levels would be even less than described above. Therefore, toxic ammonia conditions would not occur under normal operating conditions or even under system upset conditions.

DEIR page IV.I-3, paragraph 5:

PCBs were manufactured in the United States between 1929 and 1977 for such uses as electrical transformers and capacitors and fluorescent light ballasts (~~Allegri, 1986~~**Harte, 1991**). PCBs are highly toxic, persist in the environment, accumulate in biological systems, interfere with reproduction, and act as an immunosuppressant. Under the Toxic Substances Control Act of 1978, the manufacture, processing, and commercial distribution or use of any PCB was prohibited, except when contained in a totally enclosed manner. The manufacture of PCBs and the distribution of PCBs in commerce were banned in 1979. However, utilities and other owners of PCB-filled electric transformers and capacitors were allowed to maintain the equipment for its working life, if it did not leak. The USEPA Spill Cleanup Policy dictates that spills of materials containing PCBs at concentrations of 50 parts per million (ppm) or greater be cleaned up within 48 hours. If a transformer has leaked, the oil is tested to determine PCB levels and subsequent cleanup requirements.

DEIR page IV.I-4, paragraph 2:

New transformers (installed after 1983) contain a nameplate that specifies the PCB content level, which is less than1 ppm. If an individual wants to have a transformer tested, there is a charge for the test, which varies based on the size of the shutdown and the size of the transformer. If the transformer exceeds a PCB concentration of 50 ppm, the fee is refunded (~~Allegri, 1986~~**Harte, 1991**).

DEIR pages IV.I-16 and IV.I-17, References – Hazardous Materials:

REFERENCES – Hazardous Materials

~~Allegri, Theodore H., Sr., *Handling and Management of Hazardous Materials and Waste*, Chapman and Hall, 1986.~~

California Environmental Protection Agency (Cal-EPA), Department of Toxic Substances Control, *Lighting Wastes*, 1992.

Harte, John; Holdren, Cheryl; Schneider, Richard; and Shirley, Christine; *Toxics A to Z, A Guide to Everyday Pollution Hazards*, University of California Press, 1991.

San Francisco Public Utilities Commission (SFPUC), Tesla Portal Hypochlorite Station, *Hazardous Materials Business Plan*, 1997a.

San Francisco Public Utilities Commission, San Antonio Pump Station, *Hazardous Materials Business Plan*, 1997b.

San Francisco Public Utilities Commission, Harry W. Tracy Water Treatment Plant, *Hazardous Materials Business Plan*, 1999.

U.S. Environmental Protection Agency (USEPA), Note to Hank Habicht regarding Disposal of PCB-Containing Fluorescent Light Ballasts, 1992.

Vista Information Solutions, Site Assessment Plus Report, Tesla Portal, 1999a.

Vista Information Solutions, Site Assessment Plus Report, San Antonio Pump Station, 1999b.

Vista Information Solutions, Site Assessment Plus Report, Pulgas Water Temple, 1999c.

Vista Information Solutions, Site Assessment Plus Report, Harry W, Tracy WTP, 1999d.

DEIR page V-15, section entitled “Operational Impacts to Architectural Resources”:

Operational Impacts to Architectural Resources

The following measure addresses potential cultural resource impacts at the Pulgas Water Temple associated with project operation:

G-43 The SFPUC shall, as part of the project, maintain as much of the existing sound and appearance of rushing water through the Pulgas Water Temple as is feasible, given operational requirements of the water system. The pattern, amounts, appearance, and sounds of the current flow regime shall be documented to establish existing baseline conditions, and a system shall be incorporated into the project (such as a system that pumps water through the temple) to simulate the existing conditions. It is expressly understood that, currently, flows vary from none to considerable, depending on operational requirements of the overall system. All alterations to the temple shall be performed in accordance with applicable Secretary of the Interior’s *Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings* (Weeks and Grimmer, 1995).

Implementation of Mitigation Measure G-43 would reduce potential operational impacts to the Pulgas Water Temple to a less than significant level.

Draft EIR page VII-5, paragraph 4:

> Table VII-2 compares the impacts on biological resources under Siting Alternative 1 to impacts under the proposed project and Siting Alternative 2. **While Figure III.C-1 indicates the general location of Alternative 1 biological resources, a**~~A~~ detailed impact analysis for Siting Alternative 1 is provided in the *Biological Resources Background Report* prepared for this EIR (Environmental Science Associates, 2000). As under the proposed project, facility construction under this alternative could result in significant direct and indirect impacts on individual California red-legged frogs and San Francisco garter snakes as well as their habitats. Siting Alternative 1 is within 300 feet of breeding habitat for these two species, which is closer than the proposed project site.

Draft EIR page VII-8, paragraph 2:

> Table VII-2 compares the impacts on biological resources under this alternative to impacts under Siting Alternative 1 and the proposed project. **While Figure III.C-1 indicates the general location of Alternative 1 biological resources, a**~~A~~ detailed impact analysis for Siting Alternative 2 is included in the *Biological Resources Background Report* prepared for this EIR (Environmental Science Associates, 2000). As under the proposed project, facility construction under this alternative could result in significant direct and indirect impacts on individual California red-legged frogs and San Francisco garter snakes as well as their habitats. Siting Alternative 2 is within 300 feet of California red-legged frog and San Francisco garter snake breeding habitat, similar to Siting Alternative 1, but closer than the proposed project site.

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